

Hygiene

Mental Pathology

Muscular Hygiene

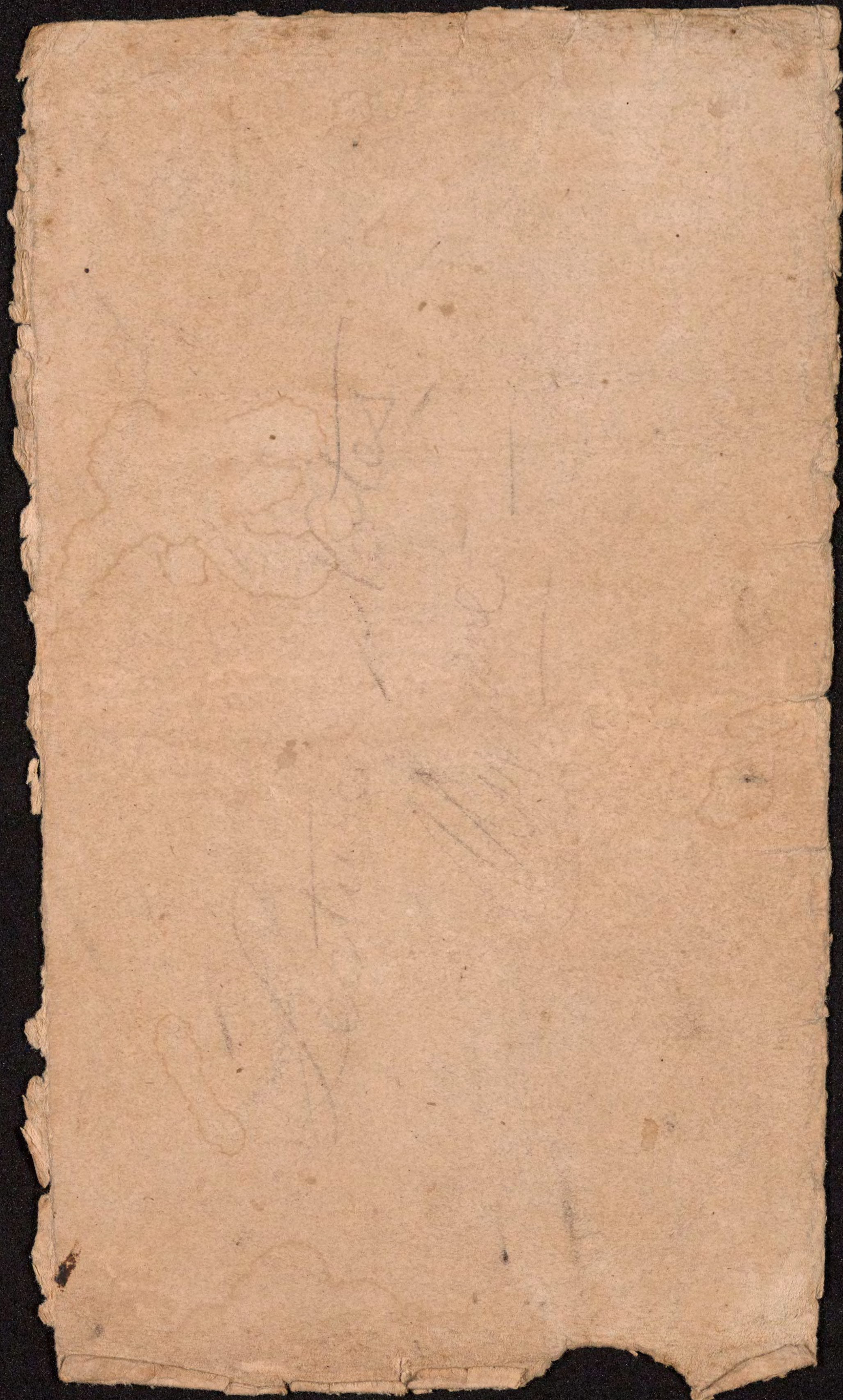
Sexual Hygiene

Respiration & Atmosphere

Hospitals

Seasons

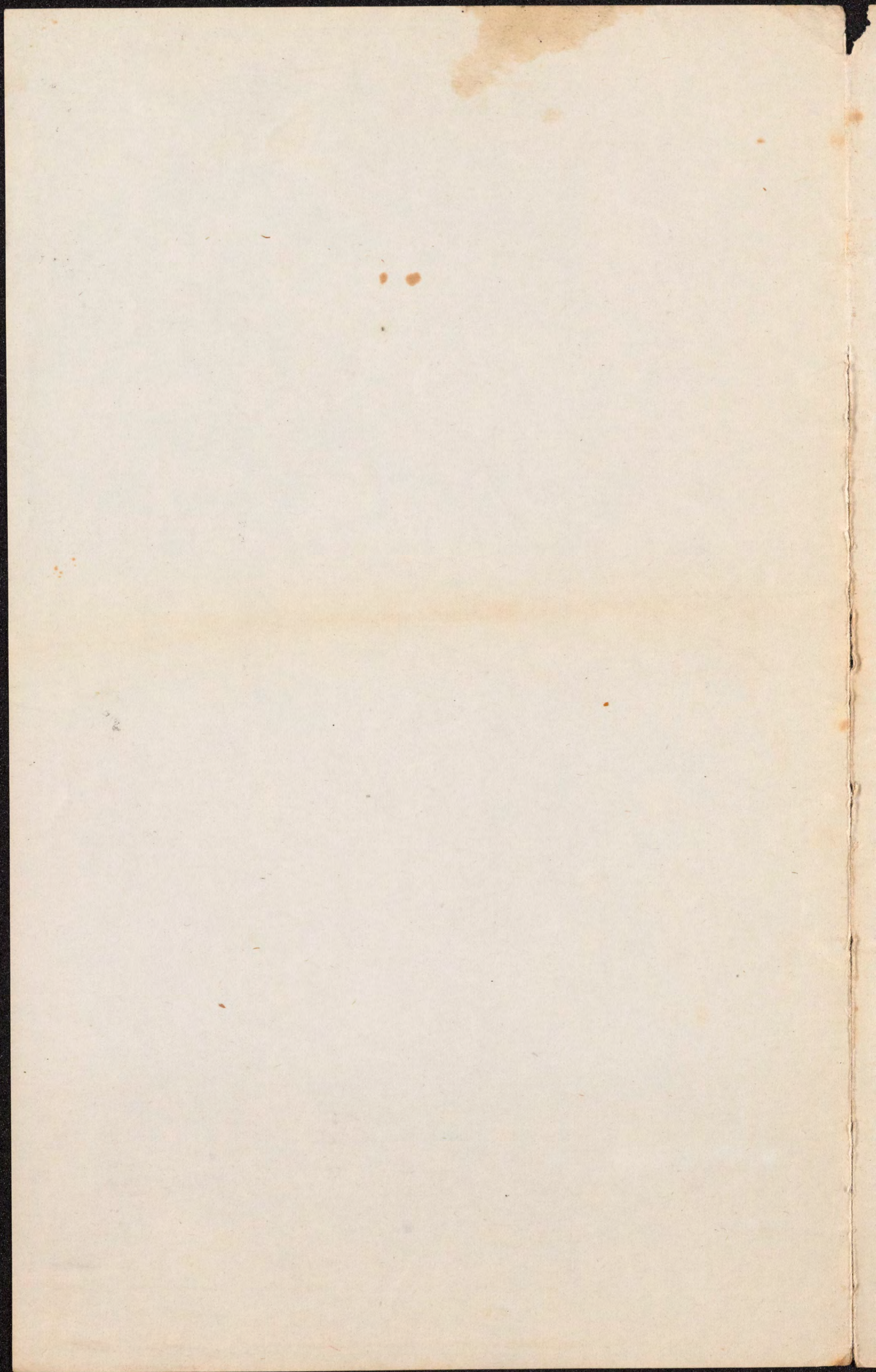
Climate



Items

for

Blackboard.



For the Board. (1st)

Divisions of Hygiene.

1. Personal Hygiene.
2. Public Hygiene.

Functional Subdivisions.

Alimentation.	Muscular Action.
Respiration and Atmosphere.	Excretion.
Heat and Light.	Reproduction.
Circulation.	Cerebro-nervous Action.

General Subjects.

Etiology.

Vital Statistics.

over

(2)
Maximum of Food, Arctic Regions -

10 to 20 pounds in a day.

Minimum, 20 ounces daily.

Average, 40 ounces, $\frac{2}{3}$ vegetable,
with 20 to 30 ounces of liquid.

Hygiene Of Alimentation.

1. Manner of eating. 2. Frequency.
3. Quantity of food. 4. Nature and quality.

Required Amounts of Elements.

Nitrogen — 250 (300) 350 grains

Carbon 3500 (4800) 5000 "

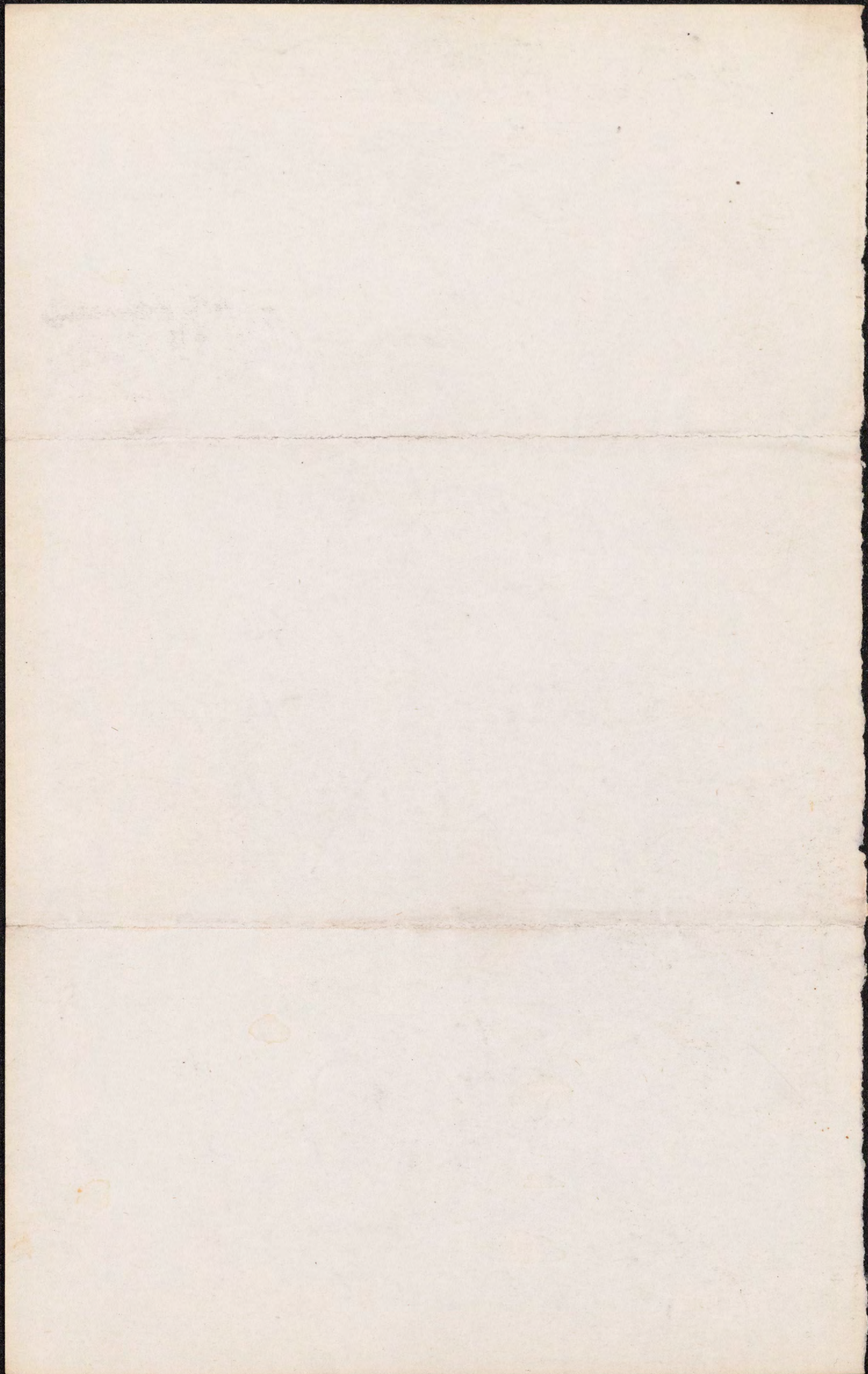
Salts ~~400~~ 400 "

Carbo-hydrogens 14 ¹/₄ ounces

Water Max. &
Minimum 98.06 "

Requisites Of Food.

1. Must contain elements of the body.
2. Must be organic (except water and salt).
3. Must be mechanically reducible.
4. Must be soluble in digestive fluids.
5. Must contain nothing poisonous.
6. Must not be offensive to taste or smell.



Causes of Disease.

Hereditary; as

Dynamic; "

Mechanical; "

Obstructive; "

Conditional; "

Ingestive; "

Contactive; "

Atmospheric; "

~~Hereditary~~
Over-exertion
Mental

Injuries.

Neglect of Bowels.

Heat-stroke.

~~Richness~~

~~Alcohol~~

~~Yellow Fever~~
~~at night~~

~~Temperaments.~~

Omit

1869

Friday

~~Sanguine,~~
~~Nervous,~~

~~Lymphatic,~~
~~Fibrous.~~

For

~~Tuesday
Thursday
Saturday~~ week

(74)

Times of
~~Preparation~~ Digestion
St. Martin. Or, see my
 note book?

Rice - 1 hour	Amass'd Chicken 2 3/4 hrs
Tripe	Pork
Whipped Eggs	Mutton
Tapioca	Oysters
Barley	Butter
Boiled Milk	Bread
Lamb	veal
Paranips	Boiled or Roast Chicken 4 hrs
Baked Potatoes	Salt Beef Pork 4 1/2 hrs.

<u>Wheat</u>	<u>Flour.</u>	<u>Bran.</u>
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Water	14.	10.3
Fat	1.2	2.82
Insoluble Gluten	12.8	10.84
Soluble Albumen	1.8	1.64
Dextrin & Sugar	7.2	5.8
Starch	59.7	22.62
Cellulose	1.7	43.98
Salts	1.6	2.52
<i>F</i>	100.	100.00

Varieties of Water

Distilled

Rain — Ice — Snow

Spring, Common & Mineral

Well, ordinary & Artesian

River

Lake

Marsh

Sea

(134)

Conditions of Healthy Respiration.

Sound Lungs and Air-Tubes.

(Phthisis — Peru-people — Dr Davie)

Muscular Power.

Nerve Force.

Pure Air.

Renewal of Air.

Contents of the Atmosphere.

Oxygen, 20.61 — 20.80.

Nitrogen, 77.95 — 79.2.

Watery Vapor. 1.4

Carbonic Acid. .04

Ozone.

Iodine, Nitric Acid, Ammonia.

Carburetted Hydrogen.

Sulphuretted Hydrogen.

Sulphurous Acid.

Phosphoretted Hydrogen
Vapours Organic Matters.

Organic Forms.

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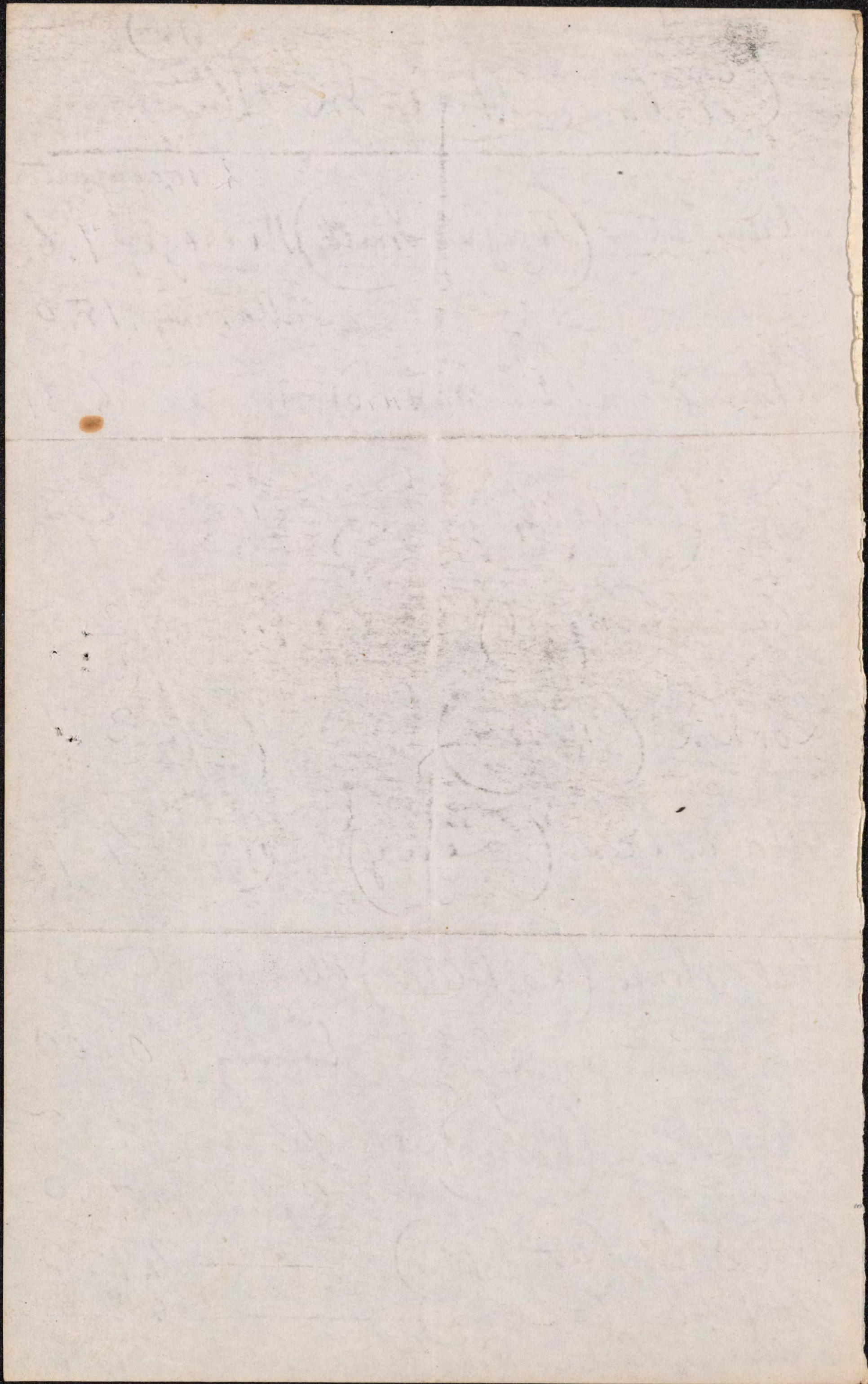
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38,58,471

(14/15)

Carbonic Acid In Atmosphere.

	In 10,000 parts	
Manchester (Angus Smith)	Average,	7.6
	Maximum,	15.0
Lake Geneva (De Saussure)	Average,	4.39
Paris (Méné)	"	2.3
Munich (Vogel)	"	3.5
London (Roscoe)	"	3.7
Atlantic Ocean (Lewy)	"	4.7
Hot-House (Le Blanc)	Morning,	0.65
	Evening,	0.00
School-Room (Roscoe)	Floor,	29.5
	Ceiling,	27.0
Beer Saloon (Pettenkoffer)	—	49.0
Hospital (Luna)	—	43.0
Chemical Lecture Room (Le Blanc)		67.4



Production of Ozone.

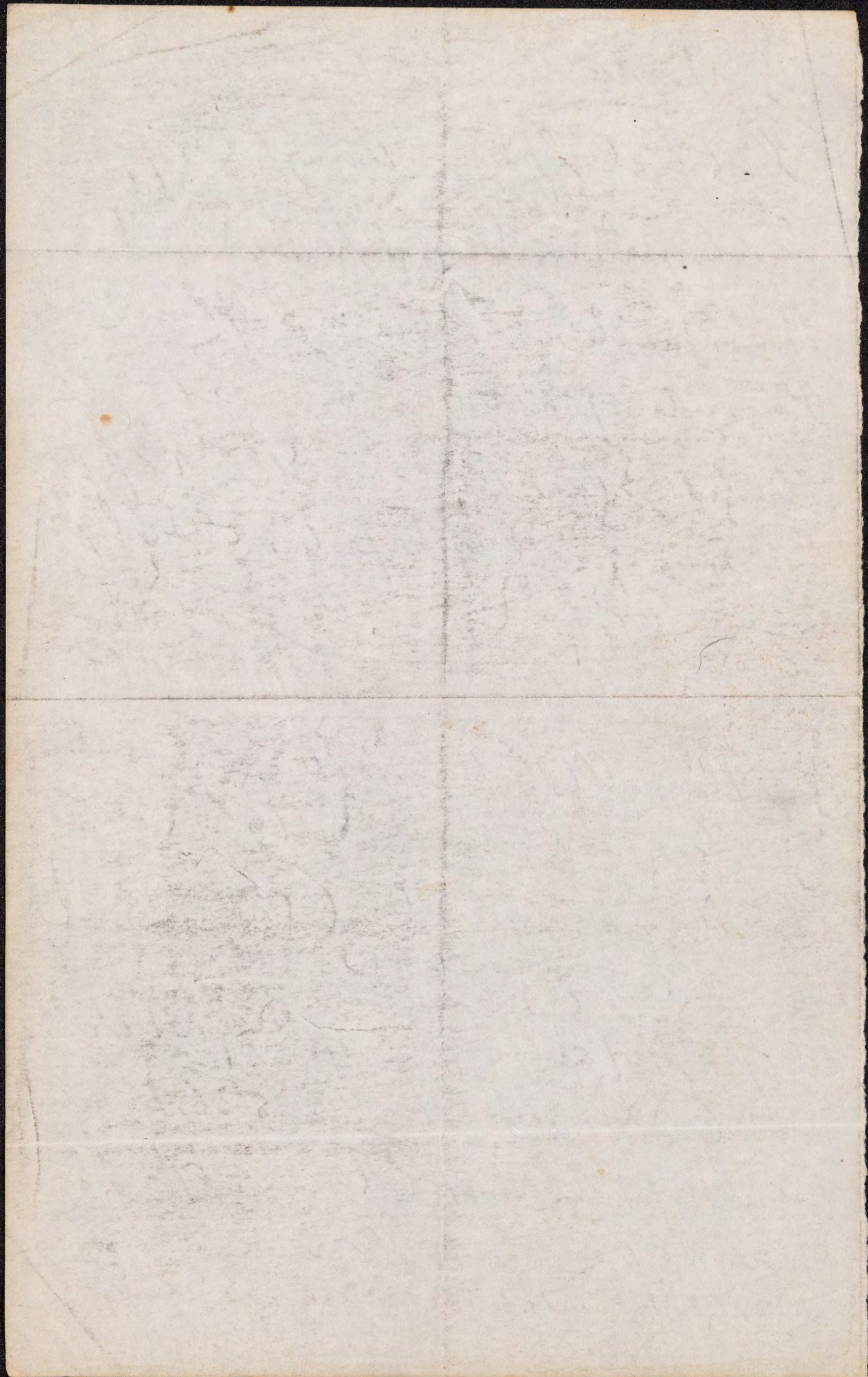
- Electrical Sparks through Oxygen.
 Floating Phosphorus upon Water.
 Permanganate of Potassa in Sulphuric Acid.
 Peroxide of Barium in " "
 Heated Glass Rod in Ether vapor.
 Exposure of Oil of Turpentine to Sunlight.

Test for Ozone

- Methods of Estimation of Humidity.
 Barometer.
 Daniell's Bulb Hygrometer. (Regnault's?)
 Dry and Wet Bulbs. (Hygrodeik.)
 Hair Hygrometer (Saussure's).

Weighing.

- Weight of 1 cubic foot of Dry Air
 at 60° Fahrenheit — 536.28 grains.
 Weight of 1 cub. foot vapor — 577 "
 " 1 cub. foot of air
 saturated with moisture — 532.84 "



(2184) (1)

Elements Of Climate.

Temperature } 1. Annual Mean.
Humidity } 2. Extreme Range.
 } 3. Mutability.

Causes of Climatic Variation.

1. Latitude.
2. Altitude.
3. Nearness to Oceans, Lakes, &c.
4. Outline of Coasts.
5. Nearness to Mountains or Deserts.
6. Prevailing Winds.
7. Oceanic Currents.
8. Rain and Clouds.

Over

Classification of Climates.

	<u>Latitude.</u>	<u>Annual Mean.</u>
Torrid, 60° to 90° S.		80° Fahr.
Warm	30° N. & S.	65°
Mild	35° to 55°	60°
Temperate		50°
Cold		40°
Frigid	55° to Pole	32°
Polar		0°

next, views of Races of Men

Localized Diseases (Not Zymotic).

(22^d)

Goitre & Cretinism.
Beri-beri of India.
~~Mungus~~ foot of Bombay.
Pellagra of South Europe.
Plica Polonica.
Leprosy of the East.
Spedalskeet of Norway.

Lithiasis.

Elephantiasis.

Egyptian Ophthalmia.

Tonga ulcer of New Caledonia.

Guinea-worm (Dracunculus).

Kidney-worm (Bilharzia).

Broad Tape-worm (Bothriocephalus).

~~Large~~ ~~Small~~

Over

Hygiene Of The Skin,
Subjects.

Clothing — Cleanliness — Bathing.

Warmest Materials.

23^a

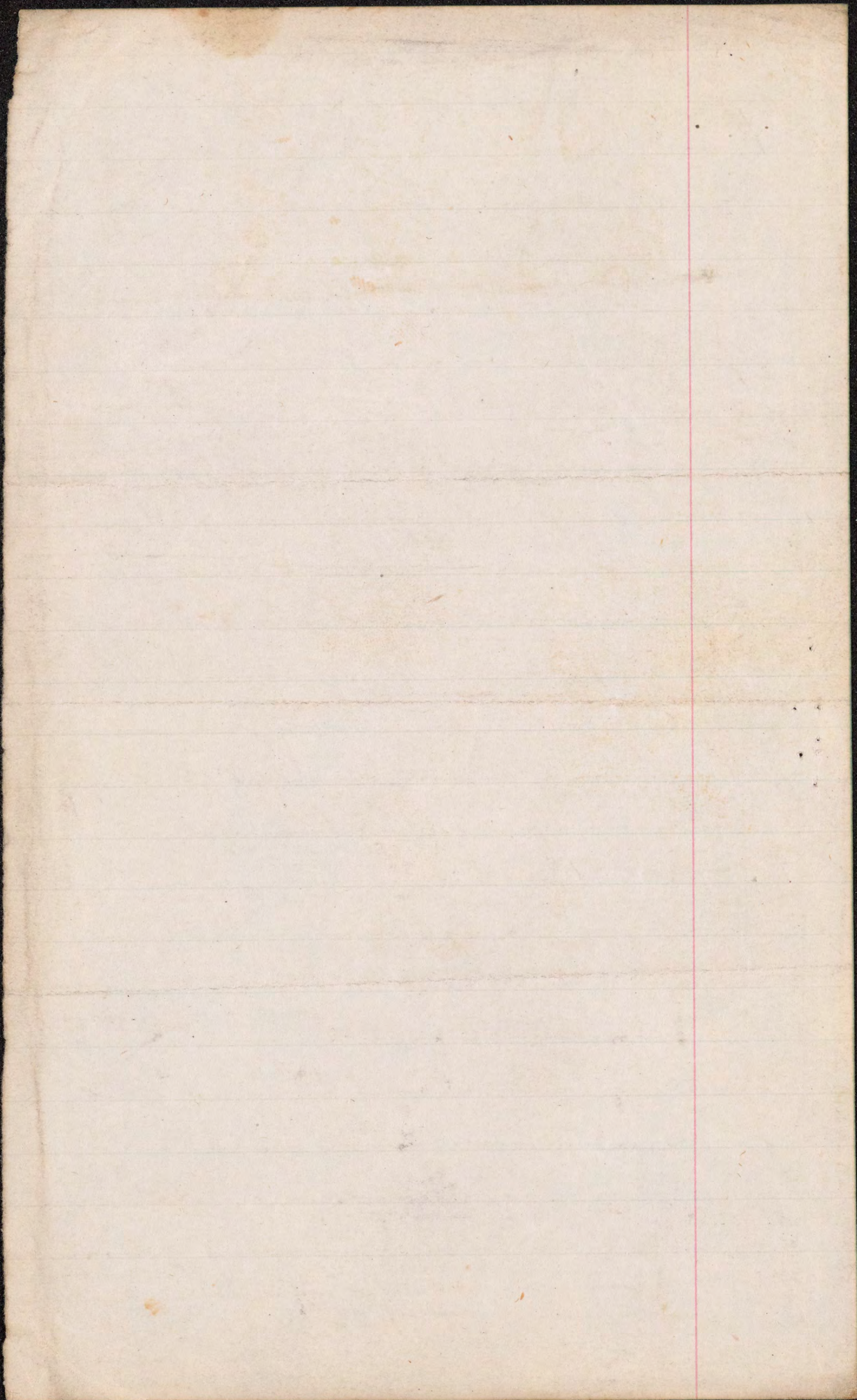
1. Wool, or Furs.
2. Silk.
3. Cotton — e.g., flannel.
4. Linen.

Clothing

1. Must be sufficient, but not excessive.
- ~~2. Not excessive in amount or pressure.~~
2. Properly distributed over the body.
3. Permeable to air and moisture.
4. Changed, for cleanliness.

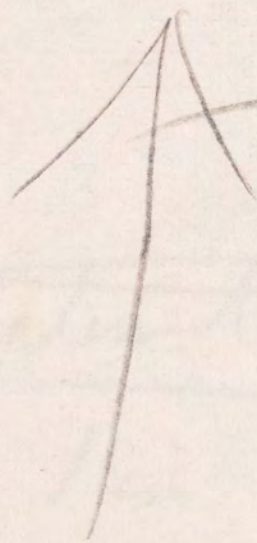
Baths.

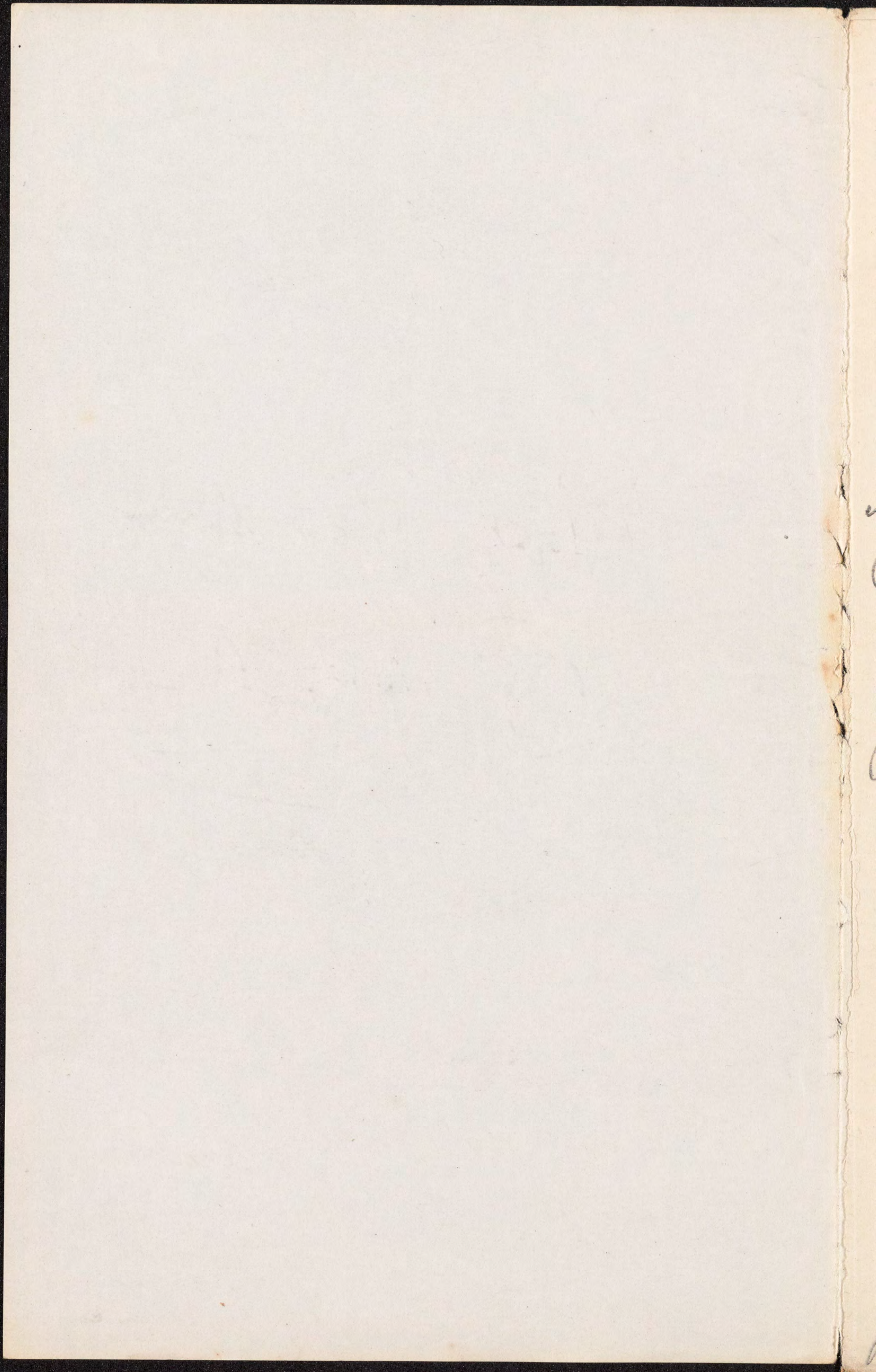
Cold	32° to 70° Fahrenheit.
Cool	70° " 85° "
Tepid	85° " 90° "
Warm	90° " 96° "
Hot	96° " 100° "
Vapor Bath	100° " 120° "
Hot Air Bath	130° " 250° "



Vital Statistics

(See Note-Book)





D. E. M. Snow, Health Officer
of Providence R. I. gives for
1863 (See N. Y. Annual of Hygiene
Report p. XI)

N. York, mortality	1 in 35.7	popula.
Philada.	1 in 43.6	
Boston	41.2	
Newark, N. J.	43.5	
Providence	45.3	
Hartford	54.8	

another statement

London	1 in 45
Liverpool	44
Philada.	44 to 57

(over)

N. Y. mortality of late years increasing.
Dreadful especially among children;
from cholera infantum, brain disorder, pectoral complaints
& marasmus.

New Orleans mortality worst of all - 8 per cent.
about ~~4 times too great~~ for many years together.

Our local Statisticians
generally assert the mortality
of Philadelphia to be at
least as low as that of
any other large city.

Age at death —

6 per cent. die in 1st year

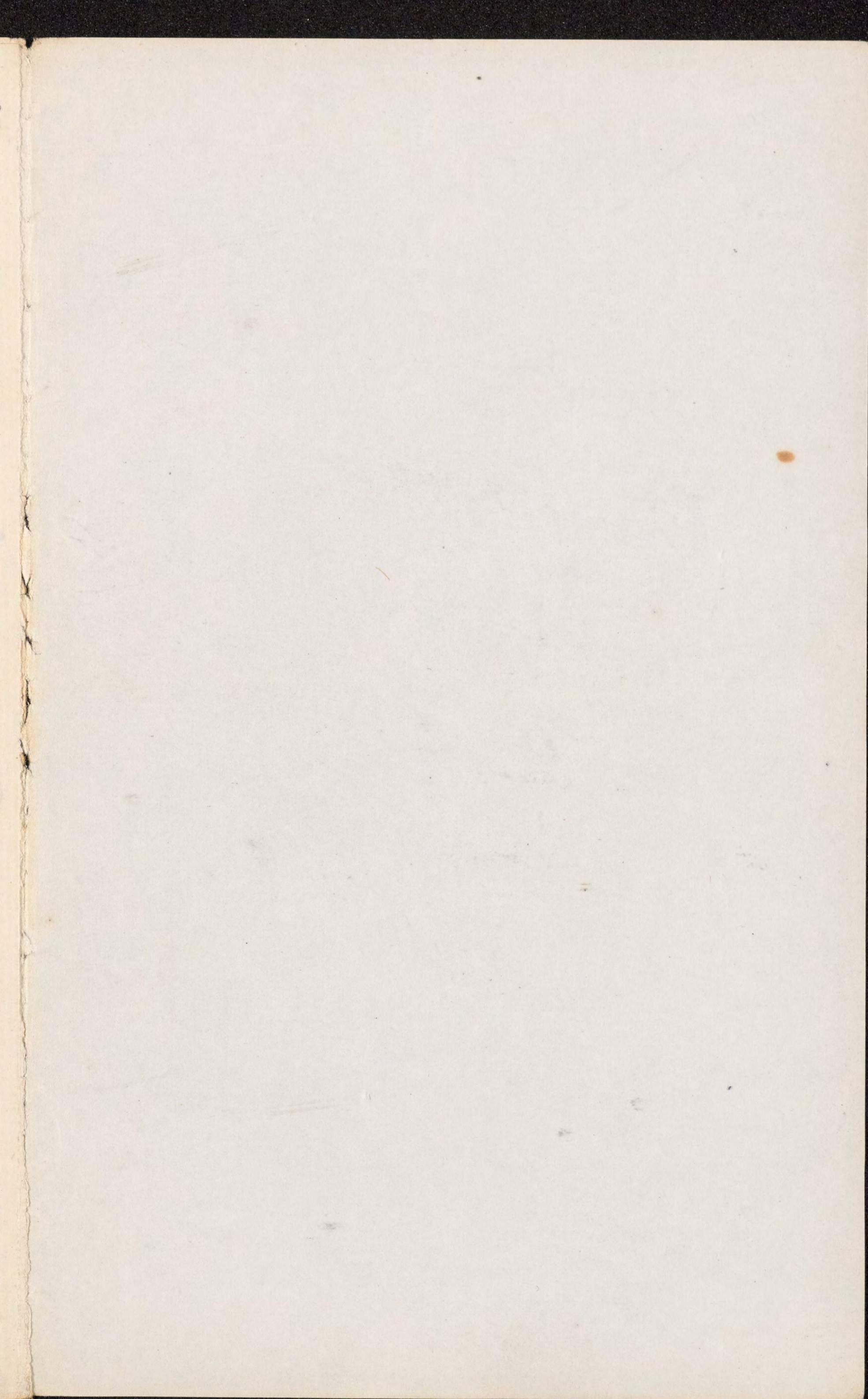
$\frac{1}{4}$ under 7 yrs —

Average 29 yrs at death England —
Manchester 20 — London only 17!
Average the world over —

about 33 years —

Larger in the country than in cities.

Population of U. S. younger
than in Europe on the average.



...many ...
...local ...

...the ...

...to ...

...the ...

...the ...

...

...death ...

...the ...

...the ...

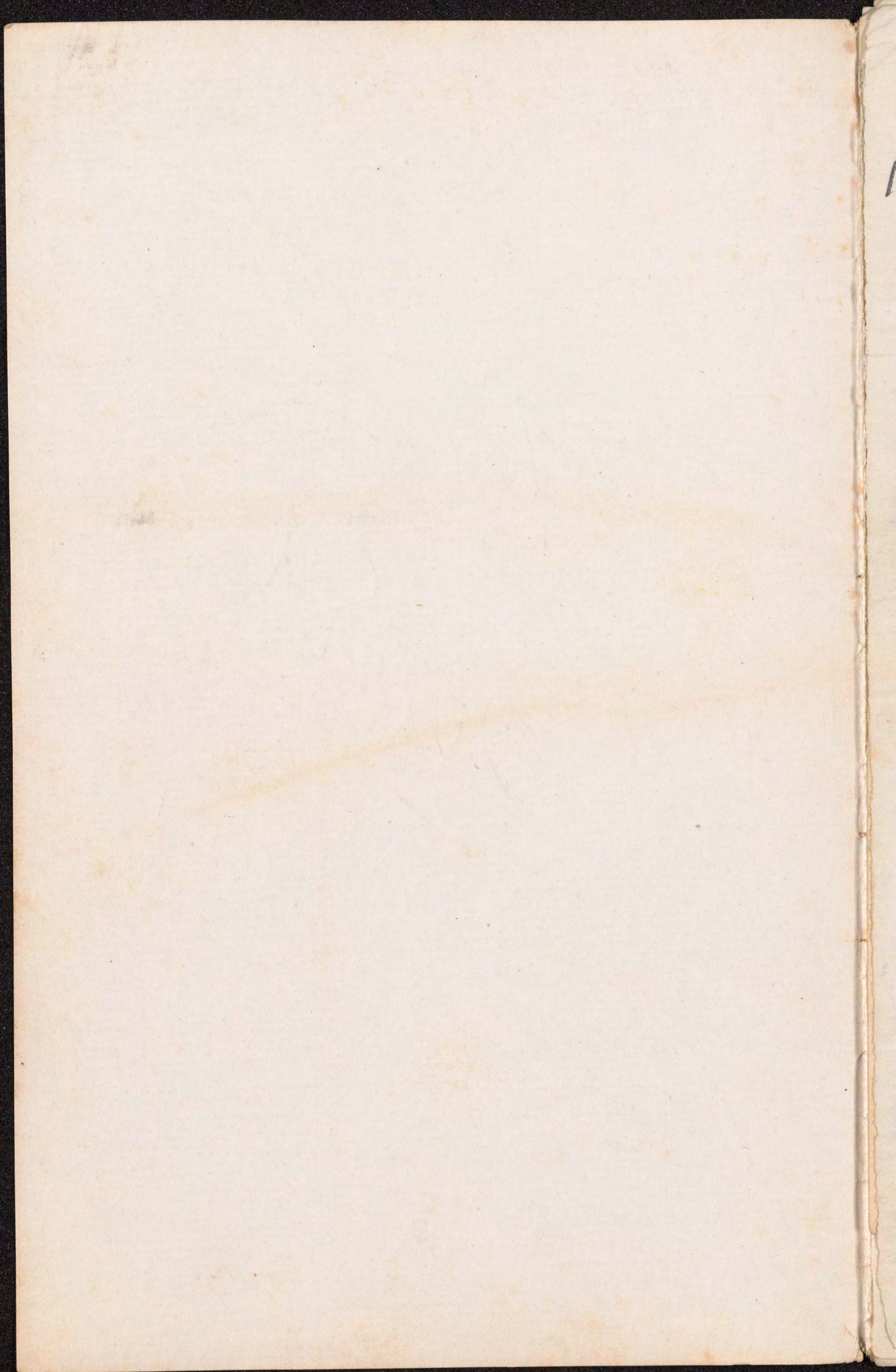
...the ...

...the ...

...the ...

...the ...

For
Board



Dalton's Average of Food: (2nd) (1)

16 oz. meat, 19 oz. bread, $3\frac{1}{2}$ oz. fat,
52 oz. water.

Parker's Average:

22 to 23 oz. of water-free food,
when not under exertion;

30 oz. of the same, under exertion.

Amount of Nitrogen, 250 - 350 grains.

Carbon, 3500 - 5000 ~~grains~~ ^{grains}

Salts, 400 ??

Water, 98.06 ounces.

Carbo-hydrogens, $14\frac{1}{4}$ ounces.

Classes of Aliments.

Nitrogenous
Oleaginous
Amylaceous

Acidulous
Saline
Aqueous.

— over —

Nitrogenous Principles.

(3d)

2

Albumen - veg. Albumen.	Neurin.
Mucin (Mucosin)	Globulin.
Fibrin - Gluten	Hemoglobin.
Casēin - Legumin.	Chondrin.
	(Gelatin)

Rank of
Nutritive Principles.

(3d)

1. Mucin.

2. Albumen.

3. Fibrin.

4. Casein.

5. Nervin.

6. Haematin, Globulin.

7. Gelatin.

1. Gluten.

2. Veg. Albumen.

3. Legumin.

4. Fungin.

Antiseptic Substances.

Salt

Sugar

Spices

Vinegar

Oil

Pyroligneous Acid.

Charcoal

Nitre

Glycerin

Sulphites.

(Dryness
Cold.)

For

Saturday's Lecture.

Drawings of

(4th)

Potato-Starch - Arrow-Root

Tapioca - Manna.

Amylaceous Group.

Starch, Dextrin,
Cane-Sugar, Gum,
Grape-Sugar, Cellulose,
Milk-Sugar, Lignin,
Sclerogen.

Cane-Sugar.

In Sugar-Cane, Sorghum, Manna,
Maple, Date-Palm, Beet-Root.

Grape-Sugar.

In many fruits, and in honey; artificially
made by action of Sulphuric Acid on Starch;
present in Diabetic Urine.

over

Varieties of Starch.

(2)

Potato

Arrow-root

Wheat

Sago

Corn

Tapioca

Tacca, of Tahiti,

Tous-les-mois.

(5th)

Milk

	<u>Cows</u>	<u>Hss</u>	<u>Goats</u>	<u>Ewe's</u>	<u>Monkeys</u>
Cash -	4.48	1.82	4.02	4.50	1.52
Butter	3.13	0.11	3.32	4.20	3.55
Sugar	4.77	6.08	5.28	5.00	6.50
Salt	0.60	0.34	0.58	0.68	0.45
Water	87.02	91.85	86.80	85.62	87.98
<u>Total</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>
<u>Sub</u>	<u>12.98</u>	<u>8.00</u>	<u>13.20</u>	<u>14.38</u>	<u>12.00</u>

Beef

<u>Water</u>	73.41
<u>Soluble Albumen</u>	2.25
<u>Insoluble Albumen</u>	15.2
<u>Lactinates</u>	3.33
<u>Starch</u>	2.87
<u>Extracts</u>	1.38
<u>Reaction</u>	0.68
	1.6x
	<u>over</u>

Notes of Beef.

Chloride of Sodium

" Potassium

Potasson

Soda

Lime

Magnesia

Oxide or Phosphate of Iron

Phosphoric Acid

Sulphuric Acid

Silica

.31

.154

.54

.026

.057

.023

.011

.435

.036

.014

John & Mother of William

Bread - 18th April 1868.

over

Ashes of Beef.

(6th)

Chloride of Sodium	.31
" " Potassium	.154
Potassa	.54
Soda	.1026
Lime	.057
Magnesia	.023
Oxide or Phosphate of Iron	.011
Phosphoric Acid	.435
Sulphuric "	.036
Silica	.014

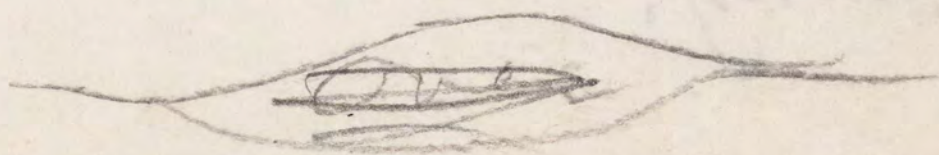
Or, instead of above, -
See p. 74 of my Note book.

This & "Modes of making Bread"
for 6th Lecture.



Modes of Making Bread.

1. Unleavened.
2. Raised with yeast.
3. With bicarbonate of potassa or
of soda, and sour milk.
4. With bicarbonate of soda and
muriatic acid.
5. With cream of tartar and
bicarbonate of soda.
6. Ditto & Phosphoric Acid
7. With carbonate of ammonia.
8. By injecting carbonic acid
into the dough before baking.



Signs of Good Meat

1. It should be red; neither pale pink nor dark purple.
2. Marble-veined with fat.
3. Not wet but firm.
4. With little odor; none that is unpleasant.
5. It shrinks little in cooking.
6. The juice should have an acid reaction.
7. Good meat contains few microscopic infusoria; inferior meat, many.

over

Good Drinking Water.

(84)

Grains Per Gallon

Organic Matter, Not above	1.5
Carbonate of Lime	16.0
Sulphate " "	3.0
Carb. & Sulph. of Magnesia	3.0
Chloride of Sodium	10.0
Carb. of Potassa & Soda	20.0
Sulphate " "	6.0
Iron	0.5

Total Solids, best water, not above 35 grains
per gallon.

Gases,

Nitrogen

6 cubic inches

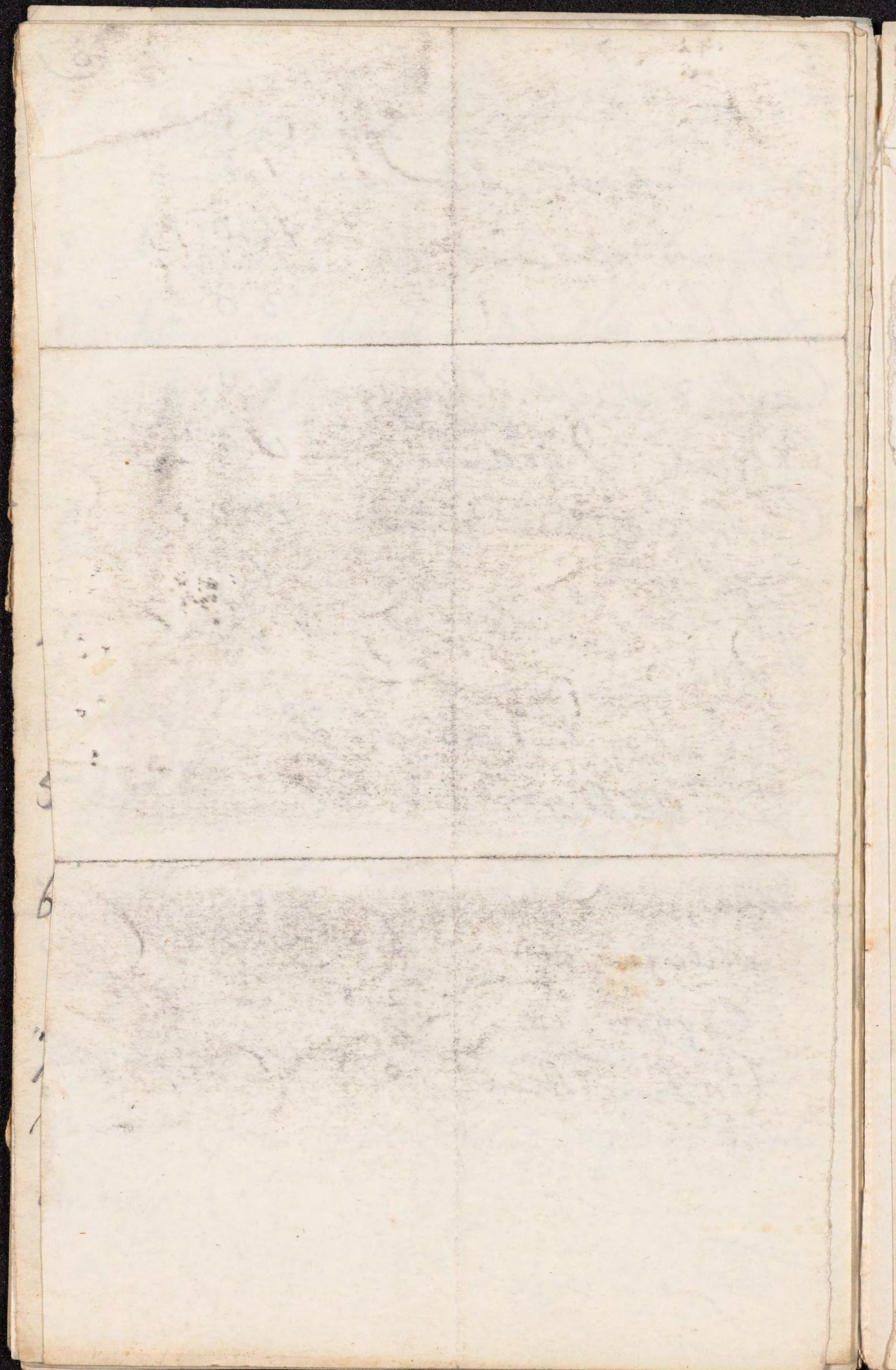
Oxygen

2.5 "

Carbonic Acid

5.5 to 7 "

per gallon

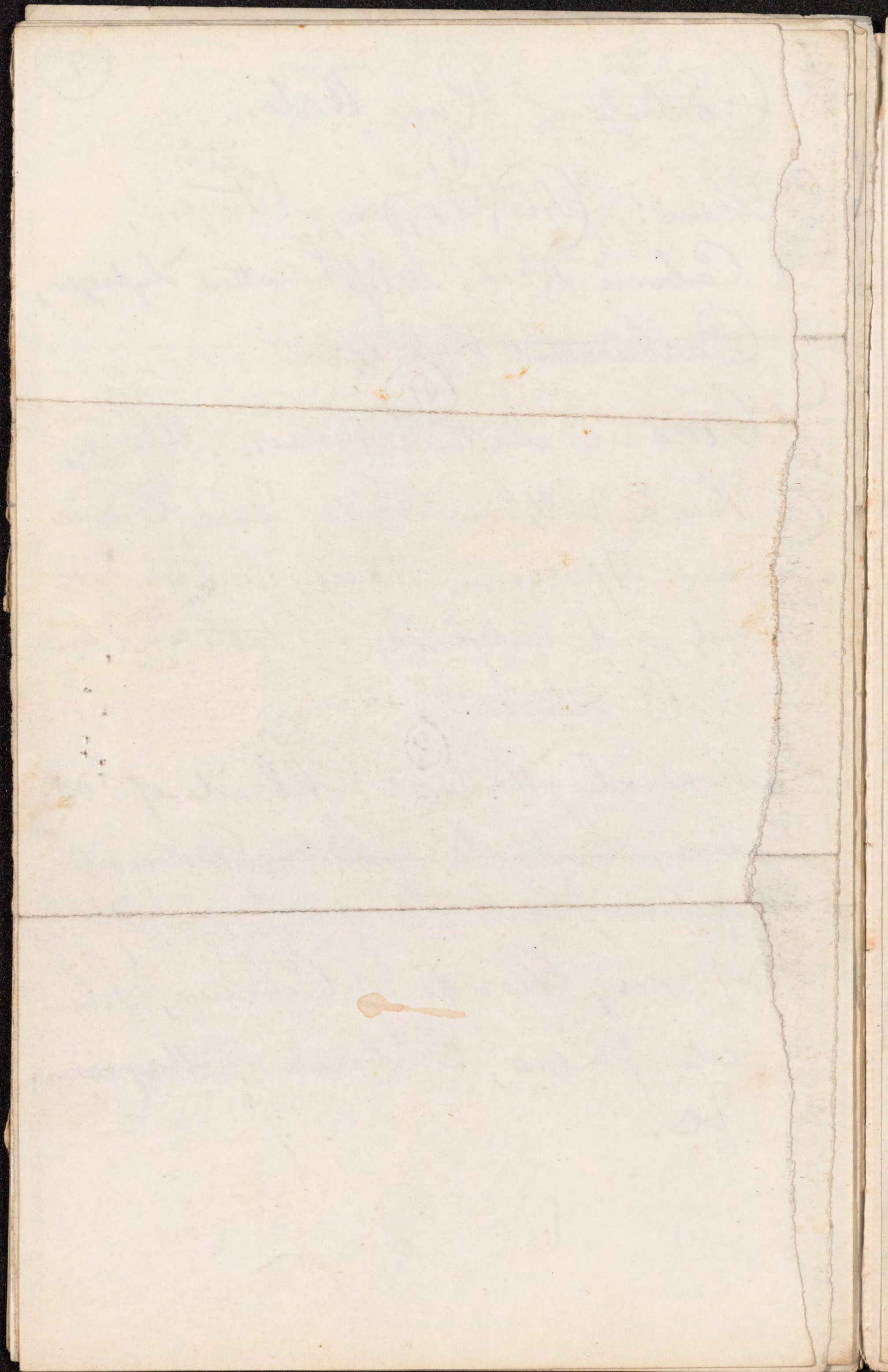


Contents of River Water.

Gases: ⁽¹⁾ (Air) Oxygen, Nitrogen, Carbonic Acid, Sulphuretted Hydrogen, Carburetted Hydrogen.

Organic Matter: ⁽²⁾ Humin, Ulmin, Humic & Ulmic Acids, Geic, Crenic and Apocrenic Acids, Butyric Acid, and undefined vegetable and animal substances.

Mineral Matters: ⁽³⁾ Chloride of Sodium, Sulphate of Soda, Carbonate of Soda, Carbonate of Lime, Sulphate of Lime, Chloride of Calcium, Silicate of Lime, Carbonate of Magnesia, &c.



Tests of Contents of Water.

1

For Organic Matter,

Permanganate of Potash, or first
Seed } N. & C.
Terchloride of Gold. } traces.

Silica and its salts,

Oxalate of Ammonia.

Chlorine, -

Nitrate of Silver.

Carthy salts, -

Drop-lattice test.

For Total Amount of Solids,

Evaporation and Weighing.

Over

974

New Filters.

2

Charcoal

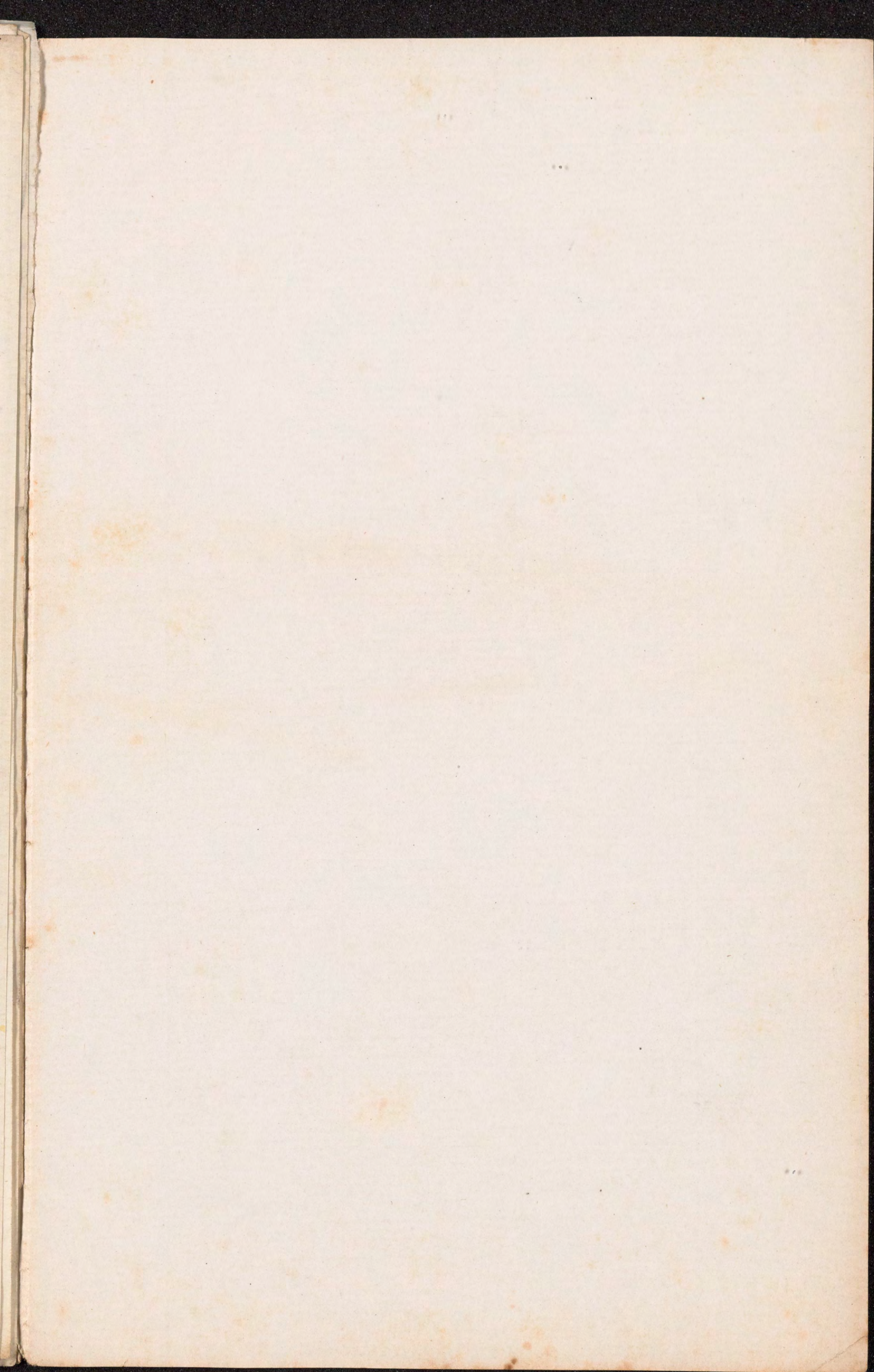
Emery

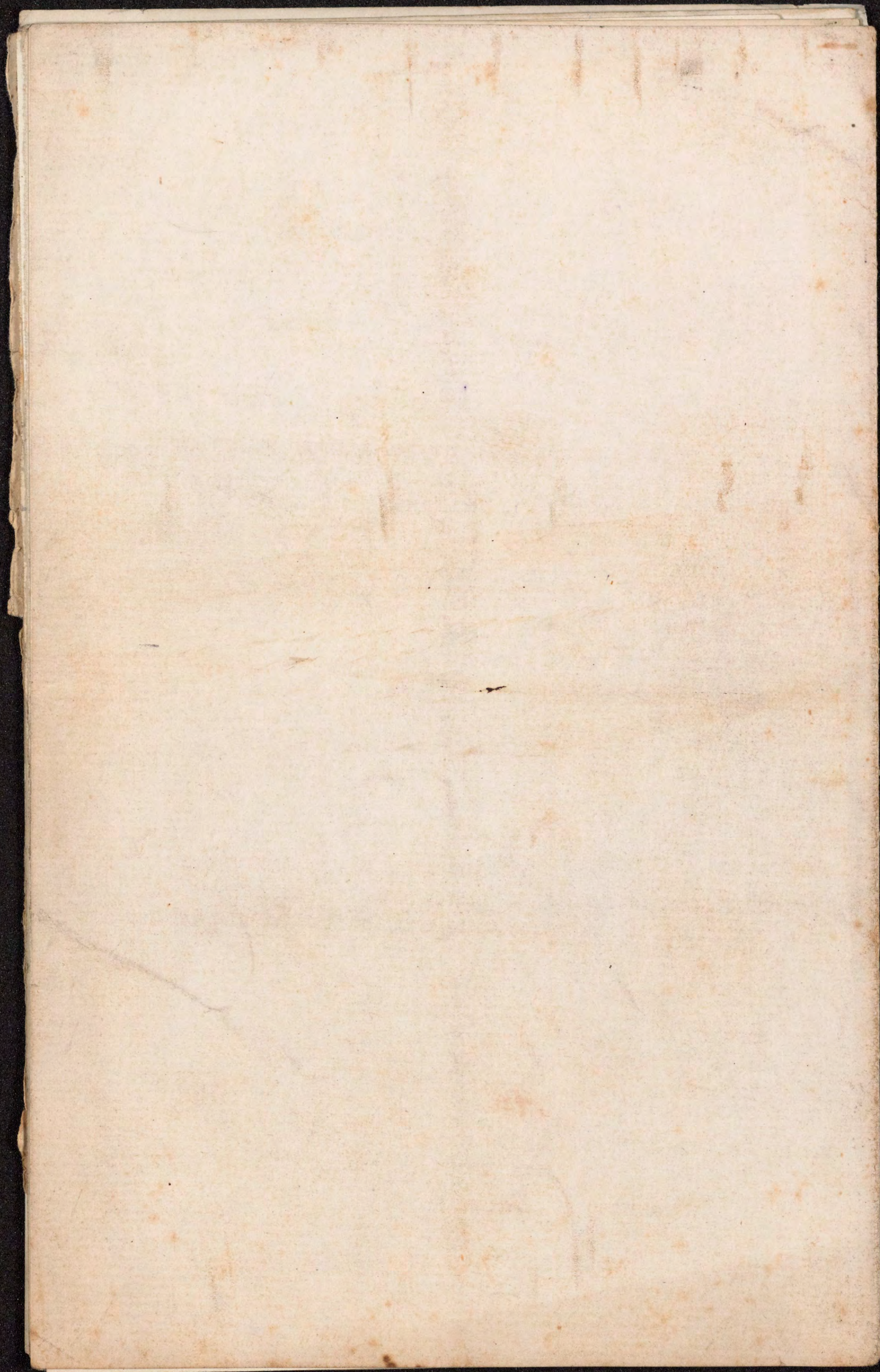
Sand

Sponge

Black Magnetic Oxide
of Iron.

Over





Hygiene of
Respiration, & the
Atmosphere.

Composition of Atmosphere.

Oxygen, near 20 per cent.

Nitrogen, near 80 "

CO₂, about $\frac{1}{2500}$ (normal)

Water vapor - variable -

Ozone

Ammonia

Nitric acid

Iodine

CO

Carb. hydrogens - heavy & light

Sulphurous & Sulphuric acids

Phosph. hydrogen

Sulph. hydrogen

Organic vaporous matter

Solid mineral particles - (salt &c)

Pollen of plants, &c,

Aerophyta

Aerozoa -

Respiration & Atmosphere.

Requisites for healthy respiration —

1. Healthy lungs — & air tubes —

2. Muscular power —

3. Nerve force —

4. Pure air —

Enough O_2 , — not too much CO_2

no ^{suppurating} ~~apoplexy~~ or blood poisoning material in it

5. Renewal of the air —

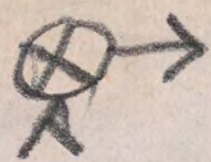
1st — Consumption — asthma — croup exemplified by defect.

2nd As to muscular power — ^{besides getting out of breath, some} all

persons may exemplify its loss. ^{Out of breath}

3rd Some of same, want of nerve force:

or paralysis of it, — as in chloroform death
or lightning stroke.



Prevention of Consumption by
early development of chest. Patagonians (S. Davis)

1. General exercise in open air.

2. Vocal Gymnastics.

Neither (active) -
when lungs diseased
(H. G. Davis)

Much must serve as a hopeful
in childhood Mouth.

Oxygen:

Average air of London, 20.95, crowded schools &
In mines, tolerably ventilated, 20.14
20.64 to 20.65

20.99 to 21.08 good air variation -
(Regnault)

Apr 18.50 - candle dims or goes out -

" 17.20 - next to impossible to breathe -

Angus Smith asserts that the difference between

20.98 and 20.999 may be of importance

to health - i.e. difference of less than $\frac{2}{100}$ of

1 per cent., or of 2 parts in 10000.

Let Pure air. —



← Air 79.2 N. 20.8 O. — ^{see & read list} _{some 0.2m}

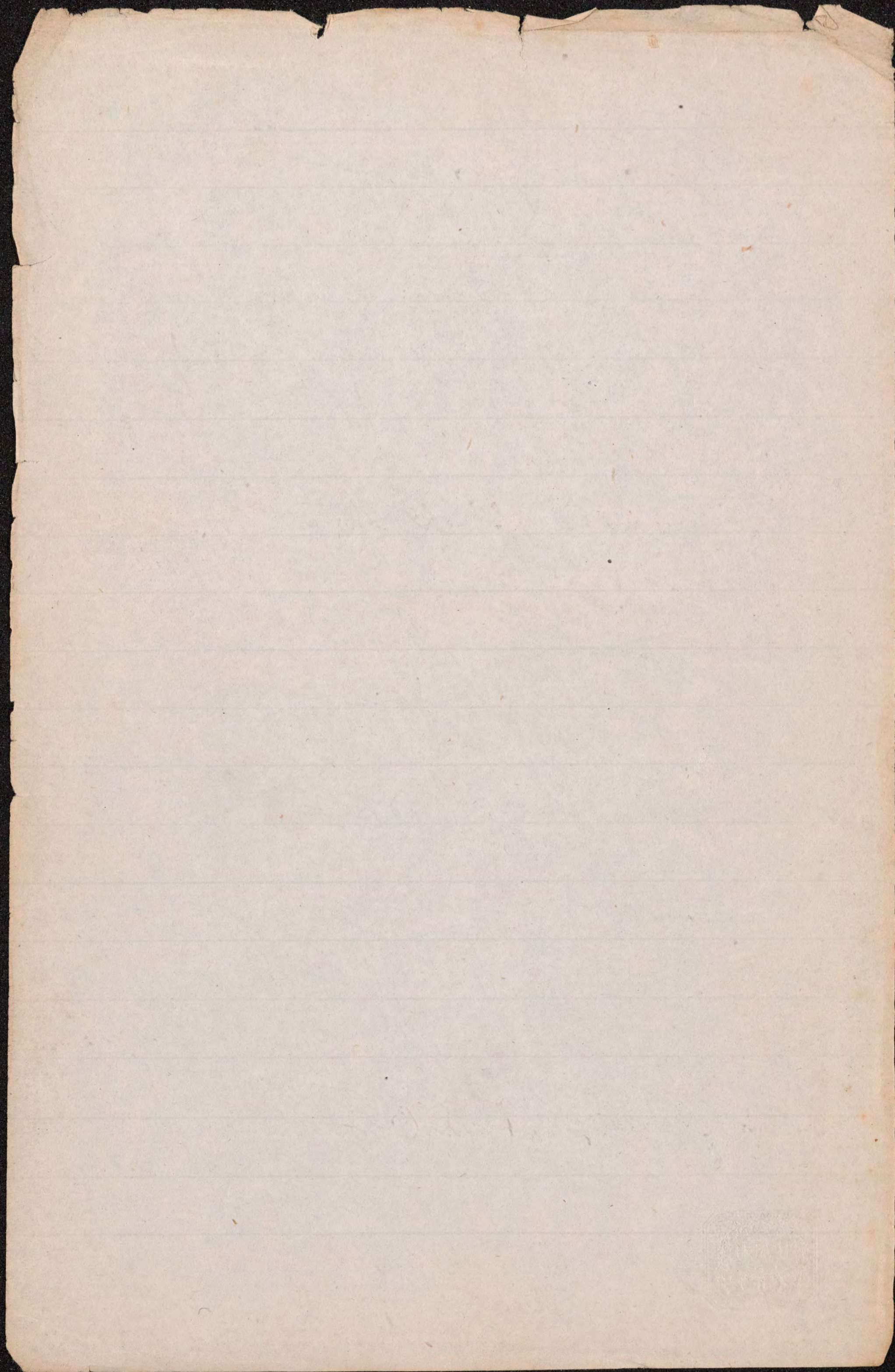
with ~~vapor~~ water — CO₂ & non-essentials.
Kept near same by winds — Diffus.

of gases — & action of plants by day —

Let Mosen, Dalton, ~~Boussingault~~
Babinet ~~Lewy~~ have found O
less at great altitudes or with localif.
Mosen found more than average at
Sea shore; Lewy less out at sea.
Clemens found more above a sheet

of fresh water inland.
of 5 tenths of one percent in the O₂ — ^{Dr Angus Smith found a difference in counting in a low count-room.}
4 to 6 10000th normal

Boussingault & Lewy found a difference of 1/5 part in 10000 parts between Paris & the count
at Rana de Lima a similar diff. in & out of Madrid.



Le Blanc, 1 part in 1000 of
vol. of CO_2 a Salpêtrière used;
10 times to meal.

Prof: Dalton of N.Y. a like diff
in a public hall full of
people & gas lights —

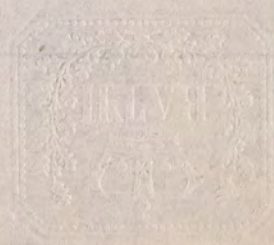
I Hammed twice to meal
at least in a chamber slept in.
Pure ventila. in 2 hrs reduced
to normal.

Pure CO_2 insp. —

If mad. — delirio — menstru another

40 p. ct. scant resp. —

Animals can bear 23 p. ct. if O be
add to turn as much (Reynolds & Perist.)
& Hammed, about 450, 30 N & 25 CO_2 — summed —





Herbert Barker, Optician
Seguin in their exp. found
no excess of O to prevent fatal
effect of near/pure CO₂ —

Mer consid. Neg. person

Blond injects CO₂ into veins of
a dog — he lived till his

head was put into a bag —
then died, altho O was admin. injected.

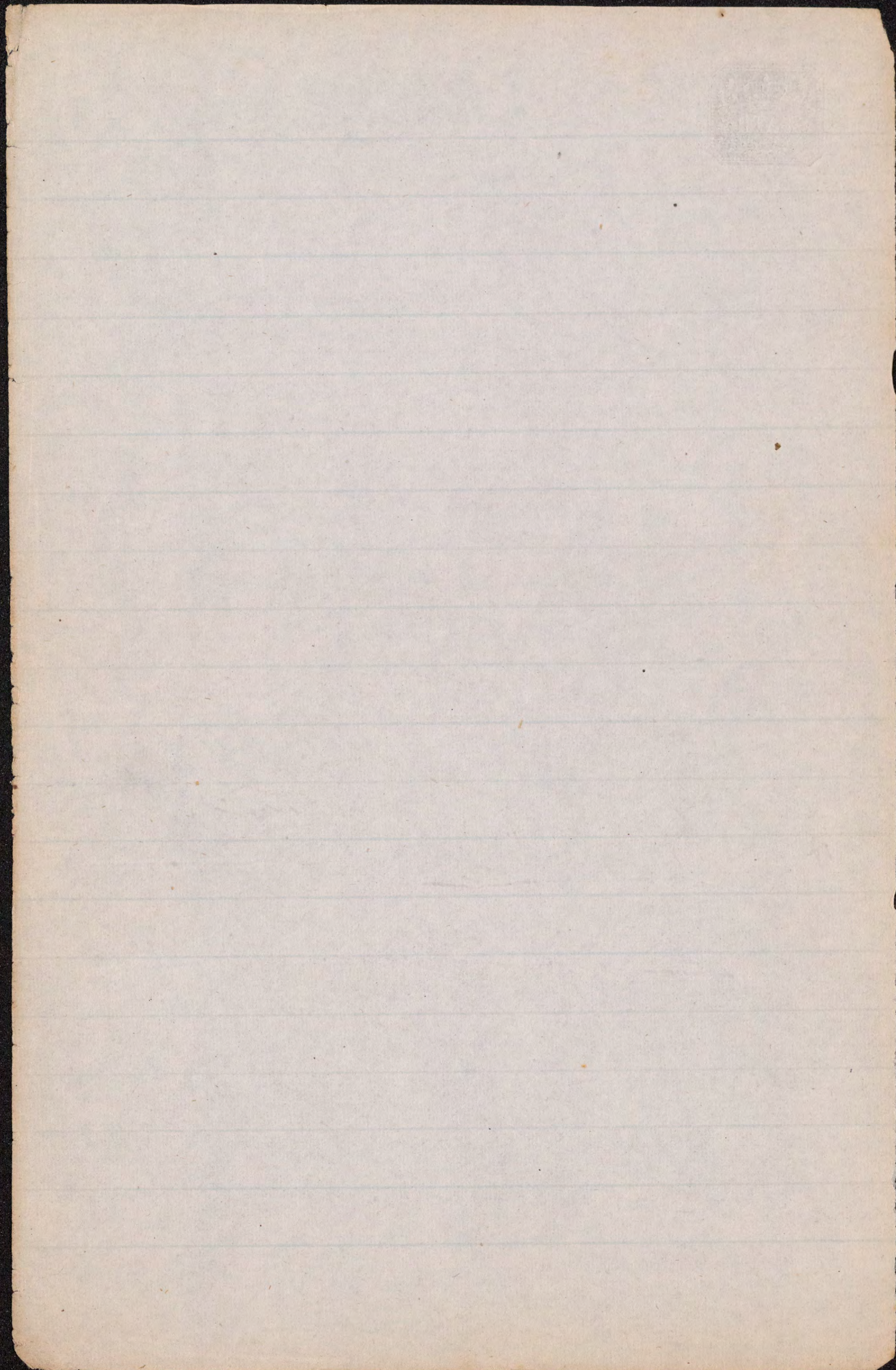
~~Another — he put head into bag~~

~~Injects O — but died still~~

The retention of CO₂ fatal

Black Hole ^{cadaveria} — 146 in room 18 ft
sq. with ^{small} ~~one~~ windows — all but 23 died before morning.

Steamer Londonderry — hatches down in
storm — 72 died in a few hours — Savondoli 69
Pelissier in Algiers — Richmond 170.



Different effects of
suffocation for example
CO₂ alone & for
crowd with various matter
for exhalation. — Black Hole
one — — — — — Earth & Ice Cane or
suicide & the other —

Charcoal or coke fire —
Dr. Mazar & fellow student —
Clergymen, my patient —

Burning gas — late —
stopped by chimney by landlady
another — — — — — Lewis & Cass of silk
small quilt — & birds

Q Damp air, other things being equal, exerts less
pressure upon us than dry: - (Hewson's surg. observ., &c)
"Low barometer" - & ^{Bert's similar} descending barometer.
Also, it conducts away more electricity:

this probably quite important.



Watery vapor in the air.

A certain amount of it is indispensable.
and
The Harmattan, of African desert,
stripped of its moisture, & ~~forming~~ a high heat,
sometimes dries the throat & lungs
& as to destroy life —

So the Simoom & Khamsin — of
Africa & Arabia: — in a stream
the safest place —

Great dampness is taken up
be injurious generally with cold: —

is a very common cause of disease.
checking perspiration, & circulation of surface of body. — also - water.
very moist warm air is relaxing to the system & settling & fever
Determination of amount of moisture
in the air belongs to Meteorology with heat.

Complex in its methods —

far from mature in its conclusions —
should now advance rapidly, as "Probabilities" daily show.

Determination of Humidity of Atmosphere,

By Weighing.

Dewpoint

Dry Wet Bulbs

Hair or Fibre Hygrometer

Average Dewpoint in England, Winter,
35° F.

Northern Winter States, 16°

Rainless & Barren regions,

Upper Egypt, Part of Persia,
New Mexico.

Weight of cub. foot dry air at 60° F.	536.28 gr.
" " vapor	577.532.94
" " Saturated air	at 0° - 606
" " " "	180.486.65

Refer to

Herschell & Sir Henry James
treatises on Meteorology - Alexander's, Loomis's
mention a few of the prominent

points now -

Humidity of the air has constant
relation to temperature -

For each degree of heat the capacity
of saturation of air with moisture is definite

But from evaporation into it, or
condensation from it, - the air undergoes
variations - below saturation, to a
considerable extent

Determined by weighing -

Don's method Boston } Daniel's Reynolds's method
Dry bulb bulbs
hair hygrometer -

Hypocrite

Practical Precepts concerning humidity.

1. Keep a vessel of water near every stove or heater.
2. Maintain Dryness in all rooms of every house by artificial heat in damp weather - spring & fall as well as winter: especially in Malarious regions.

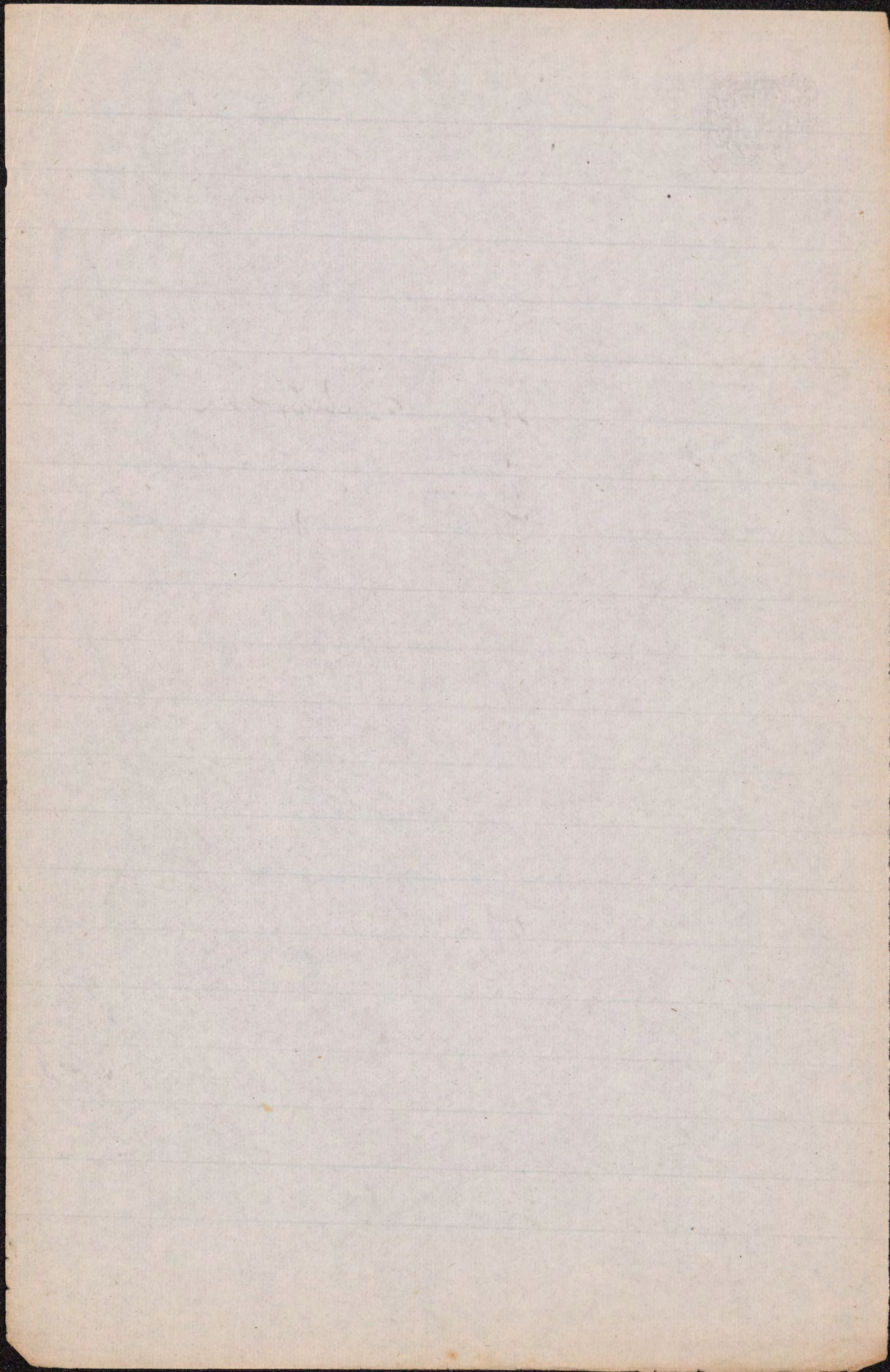
In weight — as moist air
has increase of volume — it is lighter
than dry. — Barometer assists thus — but

pressure of the air varies even more
with winds. { Barometer chiefly useful, at sea to
anticipate marked changes of wind &
on land to measure mountain heights.

— weight of a cubic foot of dry air at 60°
is 536.28^{grains}; c. ft. vapor, 517.7; but
from enlargement, actual weight of c. ft. of
satur. air is 532.84 gr. — thus less than
of dry air — At 0° , c. ft. sat. air
about 606 gr.; at 100° 486.65.

Relative humidity determinable by
compar. weights — for which Eliaher
and others have made tables which
meteorologists use.

Principle of Daniel's hygrometer
that of the dew point; i. e.,

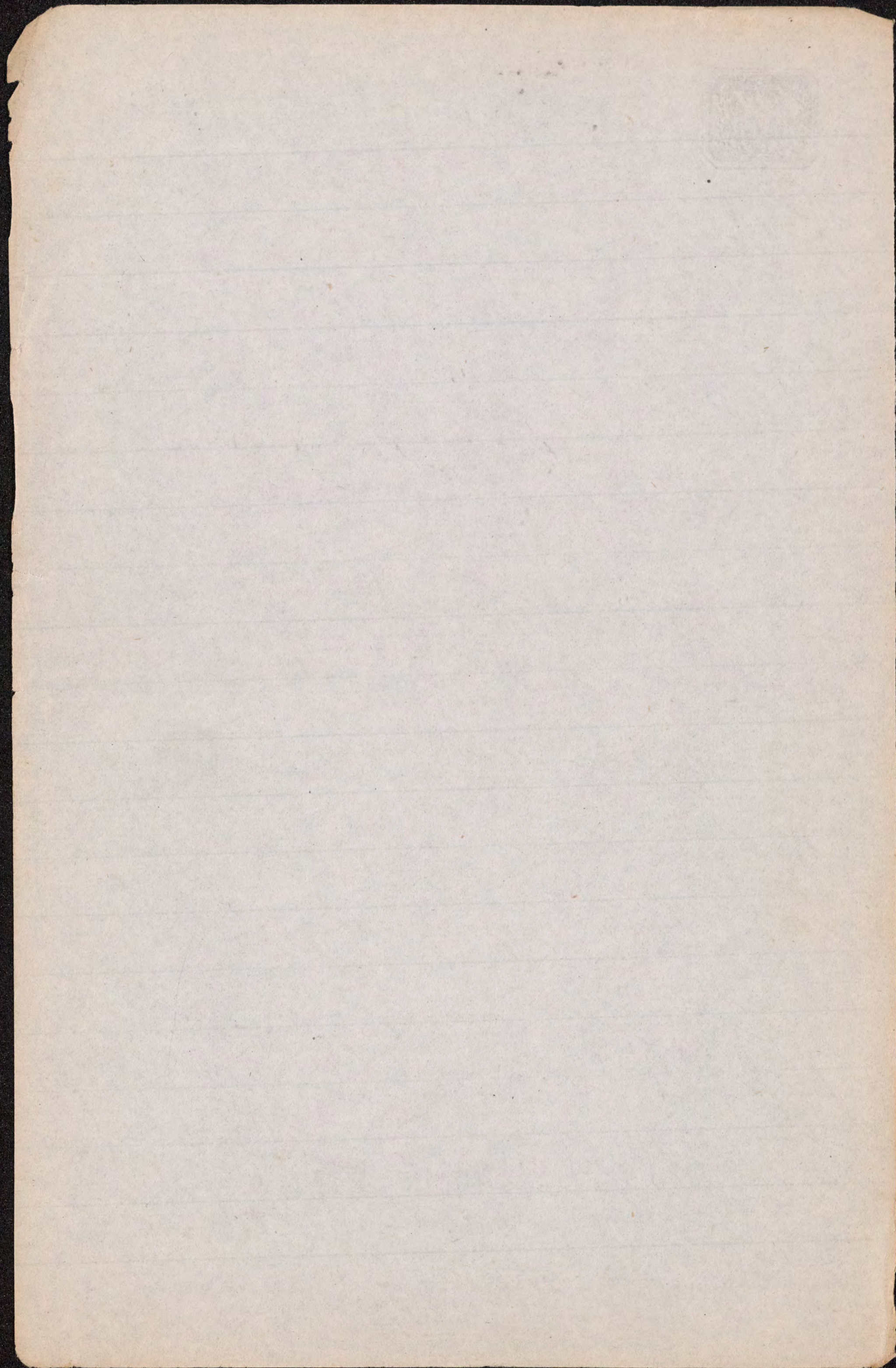


the point of temperature at which, at a given time & place, the cooling down of the air will begin to cause condensation,

Dew is produced by a condensation of moisture at night, from the cooling of bodies which radiate their heat into space. In clear weather usually the most dew — because clouds return the heat to the earth & retain coolly —

When the air is very dry, — little, sometimes no dew; as in New Mexico, part of Persia, & upper Egypt.

The dew point may be taken, then, by cooling down the bulb of a thermometer by evaporation of ether, — or by otherwise cooling

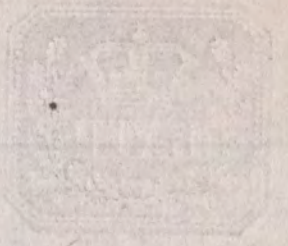


a bright surface until it
begins to have dew upon it.
(as a tumbler of ice water will
on a summer's day, with outside)
I note by the thermometer at what
temperature that begins.

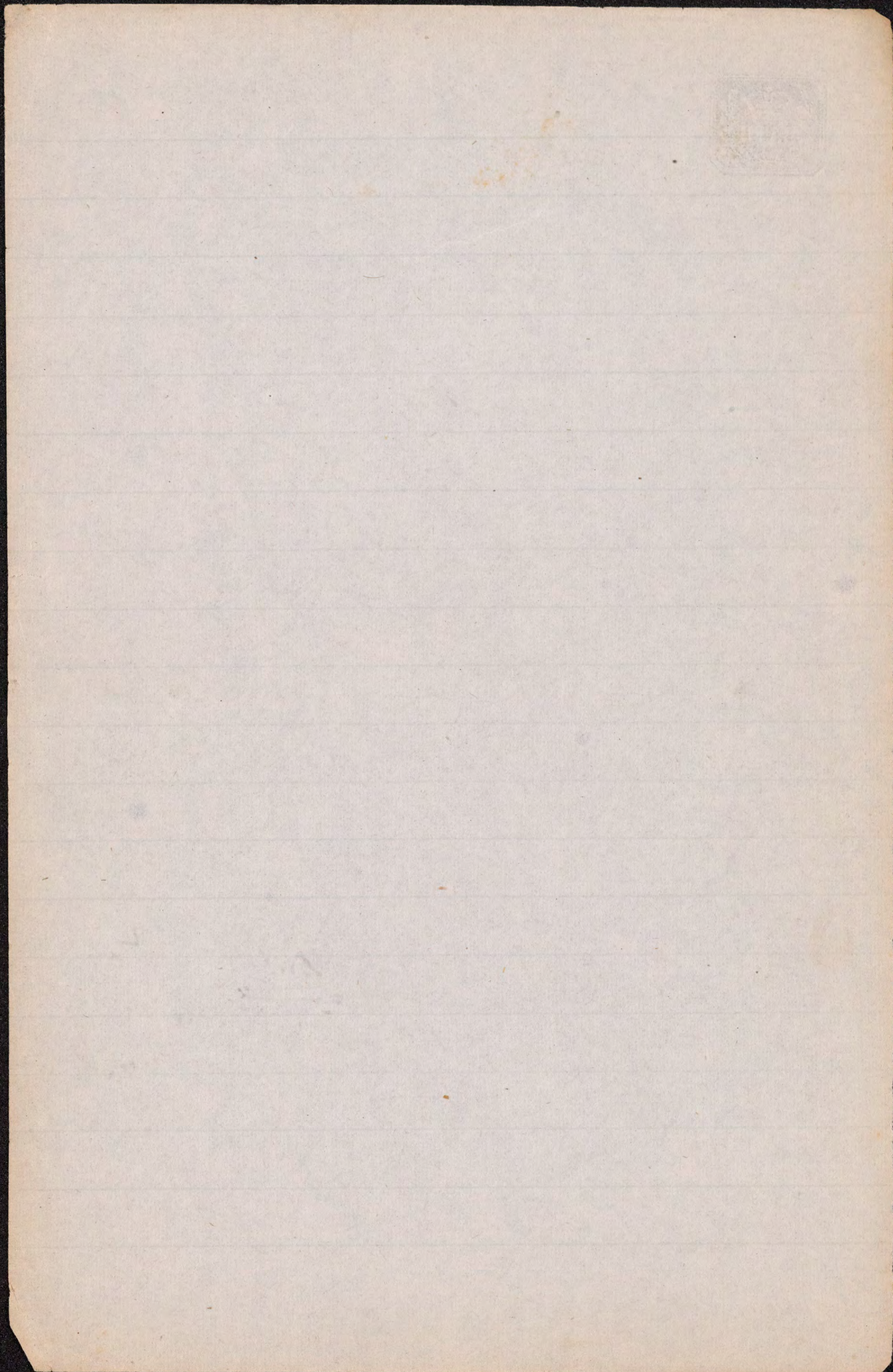
In England, the dew point is said
to average, for November & March,
 35° ; in our North States, 16° ;

England is so much more damp;
that is, dew begins from its moist
air to be depos. 19° sooner in
early, than here.

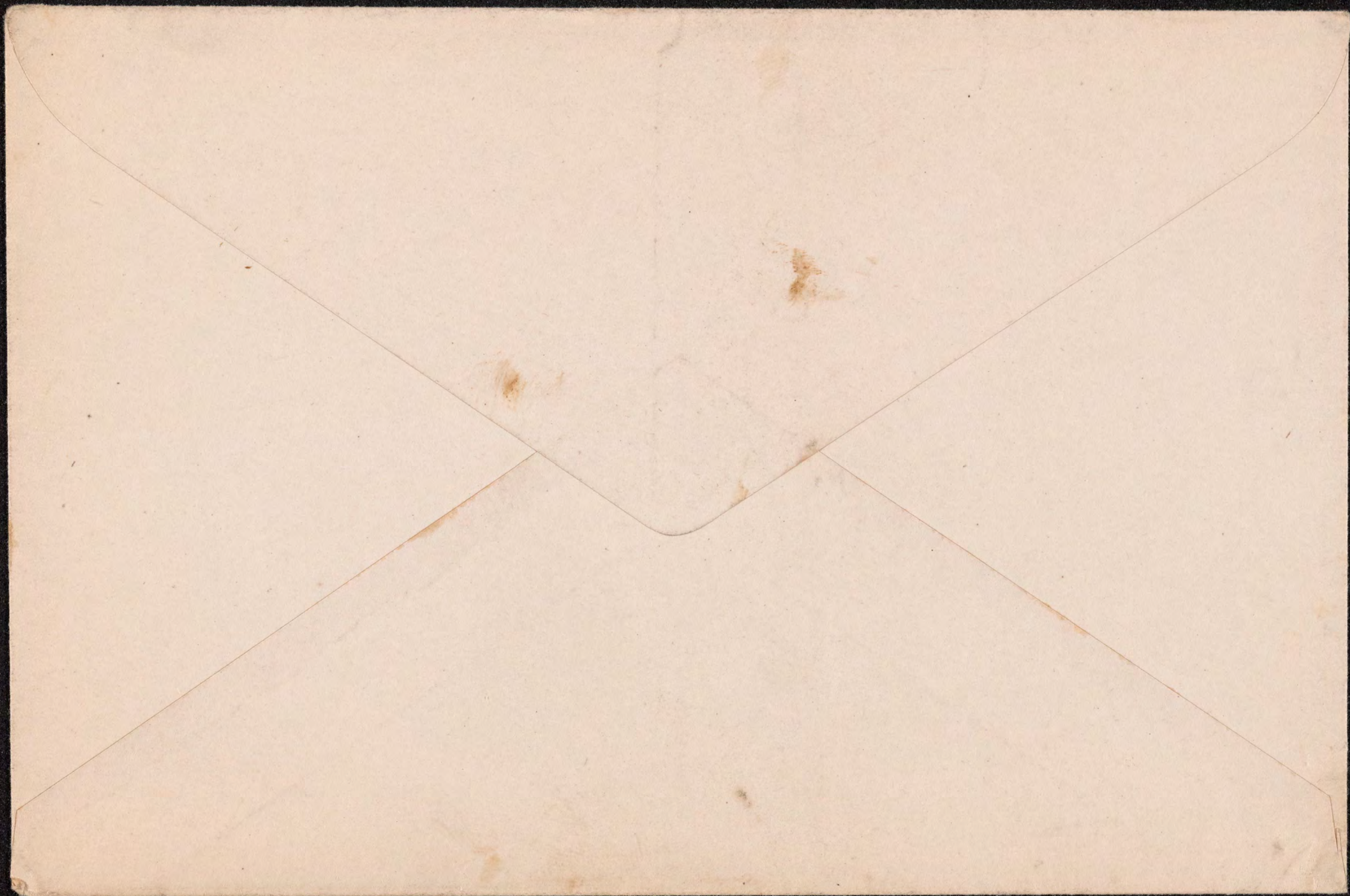
The dry & wet bulb ther-
mometers are ^{used &} compared on the
same principle. They are placed in



the shade & it from the ground,
the wet bulb being kept moist
by a strip of muslin over it, covered
with cotton ~~lints~~ and it is placed into
a water vessel. By capillary
attraction the water rises over it
cools it. The water should be rain
or distilled water. The cotton
should be soaked ^{first} in carbonate of soda
to free it from fat — or else boiled
in ether for the same purpose.
The wet bulb cools ~~to a lower degree than~~ the dry
bulb — the difference gives, by the
aid of tables — the relative humidity.
If the air is saturated, there will be
no difference.

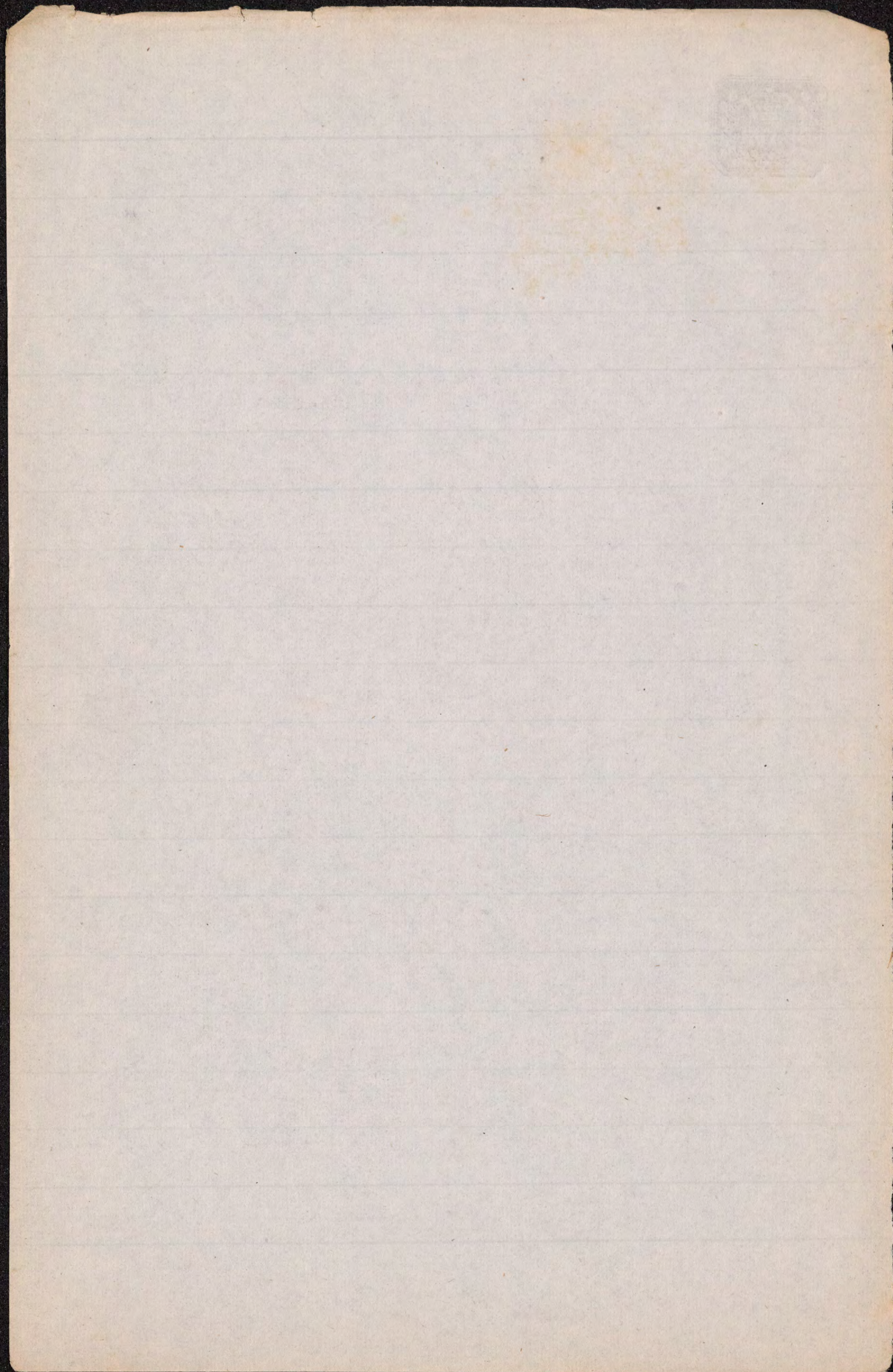


Chemical Hygroscope



Saunders invented a hair
hygrometer. A human hair is
freed from fat by ether or a
solution of potassa — & then
stretched between a fixed point &
a small needle, which traverses
a scale divided into 100 parts.
When the hair is damp, it stretches;
when dry, it contracts; & so the
needle moves to or fro upon the scale.
It is accurate for a few months —
then grows less delicate.

This instr. is graduated by wetting
it for saturation — & placing it over
 SO_3 for dryness — & so getting the
extreme points of the scale.
"Man & Woman" hygrometer on same principle.



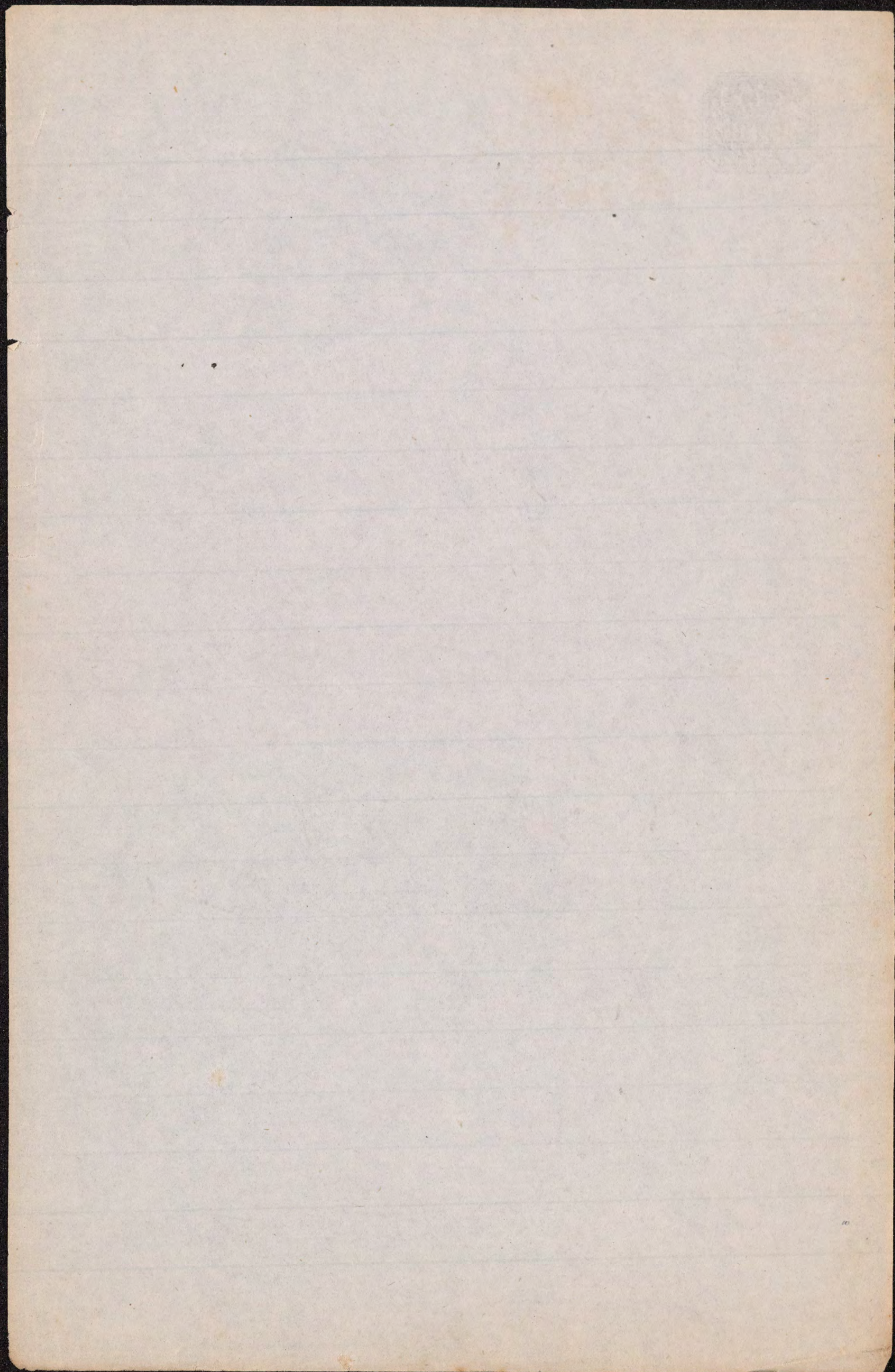
Two practical measures
in adjustment of the hygroscopic
condition of the air in houses
rooms are especially useful in
our variable climate -

One - make a fire on
damp days in spring & fall, to
dry the house or room, - & thus
prevent chilling, which at such
times so easily happens.

Especially in basements. -

Office, I had to have fire once a week
all summer. -

The other precept is, - to keep a
bowl of water over any stove - or a
large vessel of water in the air chamber of



every furnace heater — to
keep the air from being made
too dry at times.

Ozone —

An unsettled Subject,

Derigny's Committee of the
Frank Academy — Frankland
also doubts its ^{existence} ^{naturally} ^{in the air.} — of Basle
Chönheim (discovered) but

still ~~after~~ many years, investigated
it.

Dr B. W. Richardson's latest
published summary of the relation of
ozone to animal life (the air), contains
the essential facts —

Tests for iron
Prufers - iod potass & starch
not absolutely certain in all
circumstances

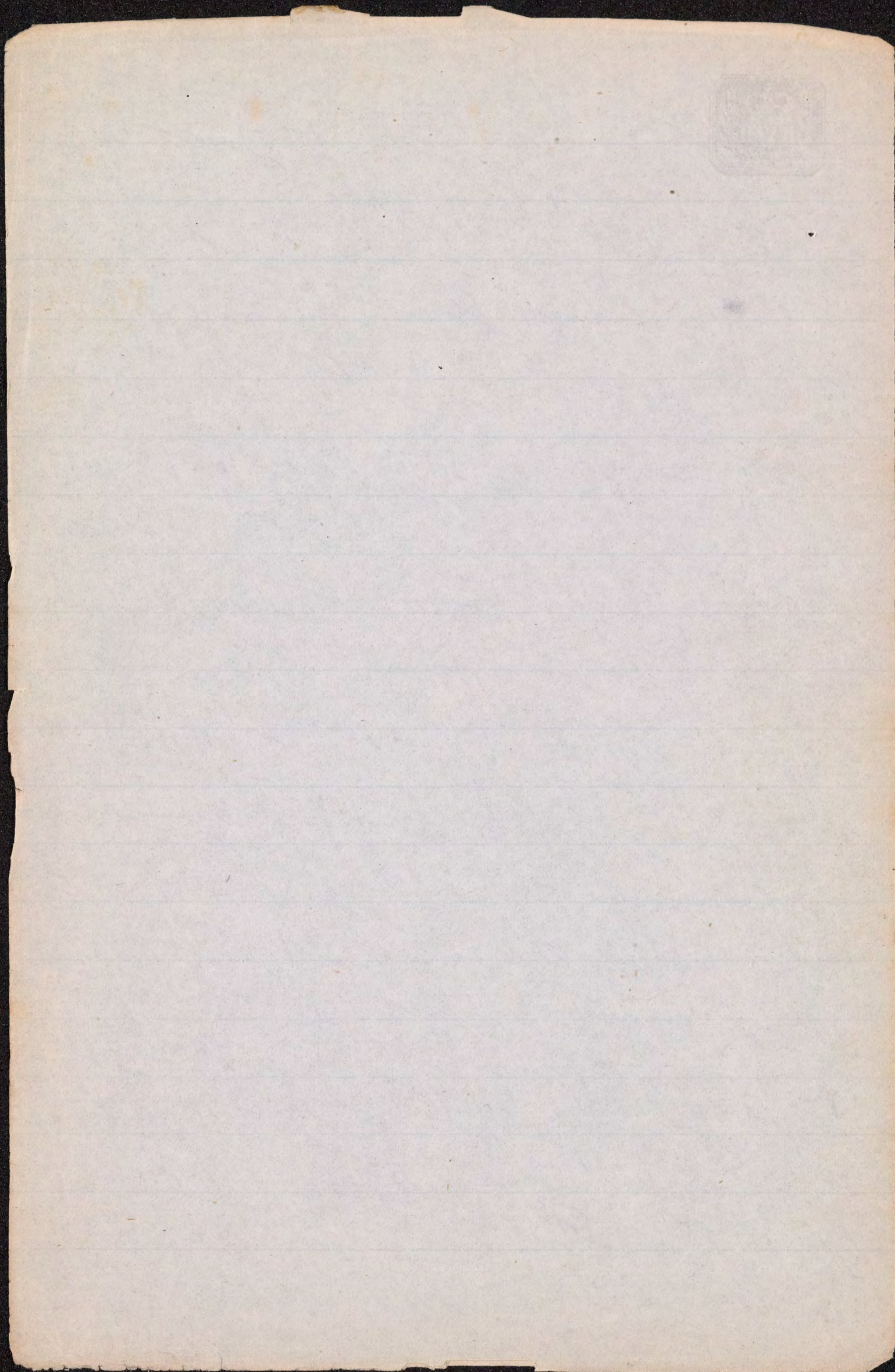
probably active oxygen as nascent - be - condensed
Ozone - made - frictional electricity
(if sparks from poor conductor, water decomposed by
electr., or with ox. at poor pole) - O, NO,
or CO₂ in glass jar & electr. sparks
thru - - - - - Heat one end of a glass
rod gently & immerse it in jar
in which vapor of rect. ether is
diffused) Scrape sticks of phosphorus till they
have metallic lustre, put in bell jar &
1/2 cover with water: large room so, even.
K on dead matter, great & quick purifier
110000 in air. - - - - - Upper equat. currents (dove)
Phosphorescence (or suffat) Lost in time -

In living animals — catarrh, pulmon, (2)
angust — even death — ~~may be~~ ^{phib}
Blood ^{more} ~~gray~~ ^{quintal} — corpse ^{more} ~~not~~ ^{rats} ~~with~~ ^{thru} ~~the~~ ^{ref.}
~~test~~ ^{influenza} ^{C. A.}

drafts ² ~~am~~ ? croup, quinsy, bacillary
pneumonia — more in ozone period —
Moffatt's theory — most ozoniferous ~~with~~
wind — cholera ~~disappears~~ (?) 80 per cent.
apople. epil. & sudden death days when
phosph. luminous (Adm. Titanic telegraph system)

Ozone Disinfectant — needed for pure air.
Spent & ^{phosph.} effects destroyed by heat above 75°
or cold below 50° (?) Re-inhalation of air
(though de-carbonized) makes it ^{unstable} ^{animals die} ^{if} ^{not} ^{operated}
(Rubinow) Autozone — ^{promotion} of putrefaction.

Dr. Clemens, of Frankfurt,
Germany, — studied carefully the
air over sheets of water,
including a marsh as one.
He found oxygen to be abundantly
given out from the surface of some
sheets of water — ozone over
pure known stagnant water —
without ozone over the marsh.
Marsh air having about as much
oxygen as the air, — the difference
would seem to be, in part, the ozone.
He ascribed the ozonization partly to
the movement of air in currents
over the water — causing electrical
excitation of it —

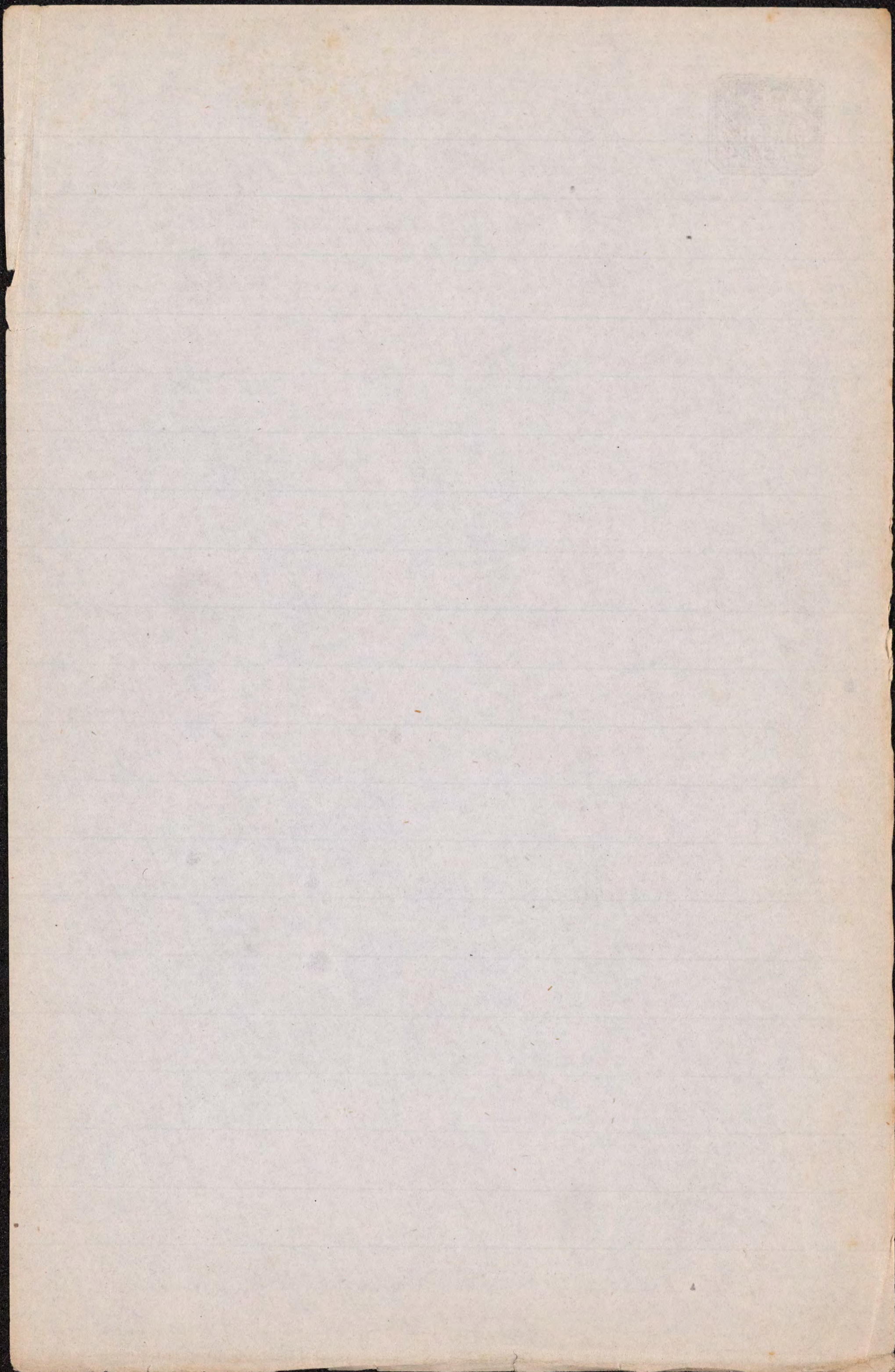


Dr Hammond several years since
when at Fort Riley, Kansas, —
^{observed} — older snakes on long grass
near him had malodorous
a good deal —

those in barns, or high
ground 1/2 mile off did not —
Ozone almost absent the
1st — much more the other places,
ozone & malaria seem to be antagonistic.

In causation of Cholera —
nothing has been proved about ozone.

It is open to further investigation.
Dr. Mitchell, an English phys. in Algeria
found many puzzling discrepancies in his observations in
ozone & malaria; & others have had a similar experience.



Non-essentials after food
in the air. —

Iodine: —

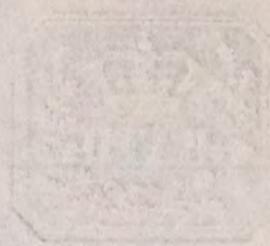
especially at sea shore

~~and the proportion~~
~~4/10~~

absorbed on respiration — to
my help to account for benefit of
Sea air to scrofulous constitutions.

NO₂ — never much in
air — most after a thunder storm.
Probably by ~~destruction~~ ^{destruction} of action —
Perhaps source of Milk to explain —

Ammonia — about 1/100 millionth —
more at night than day time — most in crowded
rooms — In Black Hole ammonia odor strong —

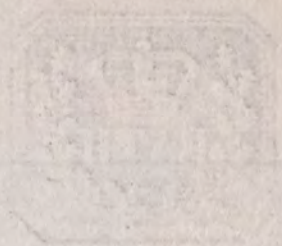


Nitrous acid, at some ~~part~~ ^{places} above
the earth - variable amount sometimes
considerable -

Sulphur Sulphur and
our coal ^{burning} towns -
sulphur is an of our houses, shown
by blacky Sulphur - sources
coal fires & burning gas -

Sulphuretted Hydrogen - from
all organic decomposition -

Purres - abundantly - shows
odor & blacky lead paint.
~~also some marshes & in mines & many volcanoes;~~
~~also some mineral springs also~~
Very unwholesome - if pure, a fatal poison



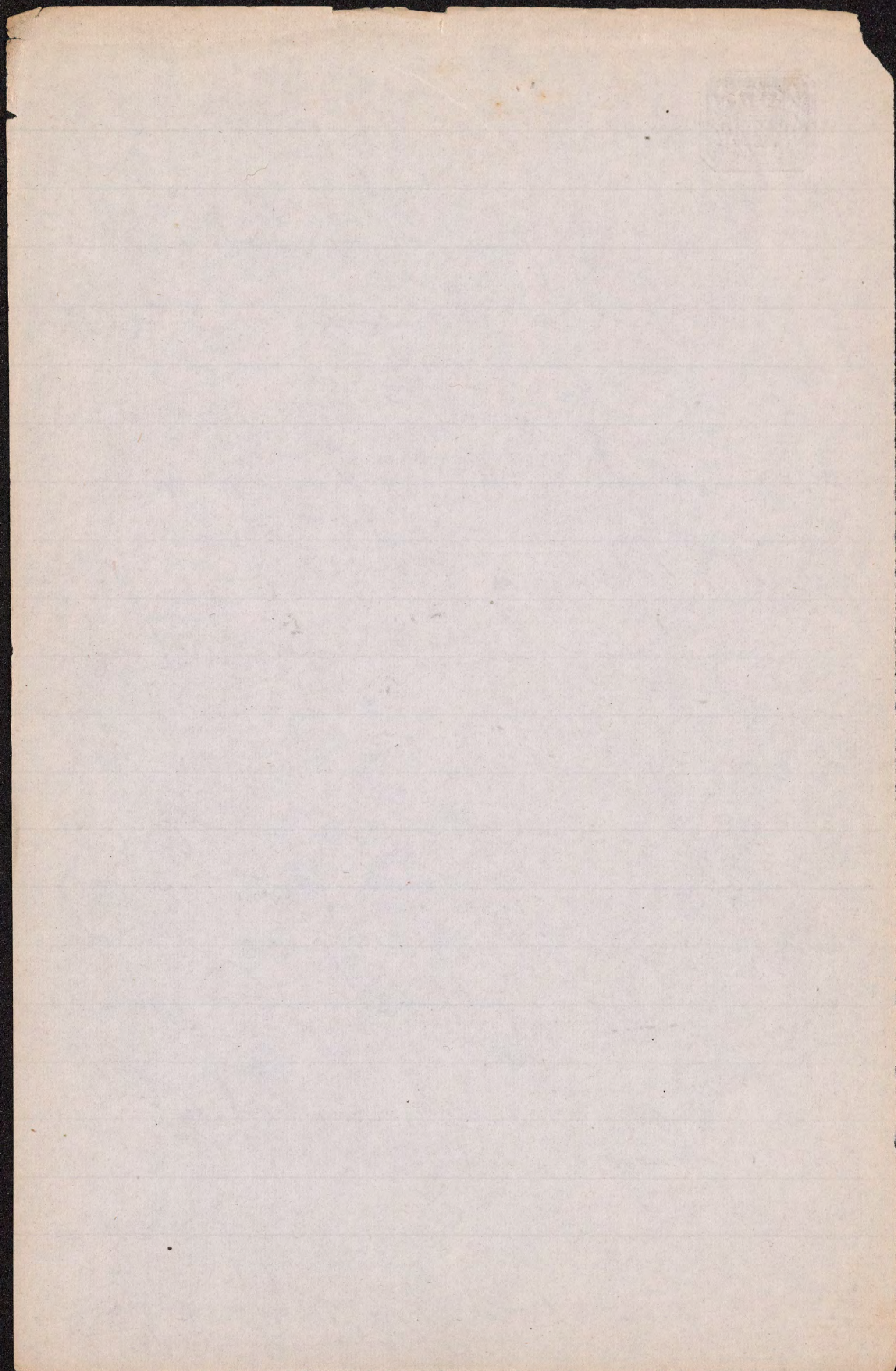
Dupuytren found 1/800 part kills
small bird quick. 1/299 a
dog. 1/250 chamber found fatal
to a horse. Met a commission
at Paris found the workmen in the
great sewers to bear an air
holds $\frac{24 \text{ to } 90}{1000 \text{ lbs}}$ — Gaultier de

Claubry staid long enough to
collect some of an air hardly
near 3 per cent of SO_2 I think
he must have held his breath.

Plants are injured by it of

Concentrated.

Strong exhalation of pring gas
sufficiently knock a man down:
with giddiness, nausea, debility, fever, delirium.



S H detects by brown anyth
being lead upon it — as strips of
paper moistened solution of acetate
of lead. —

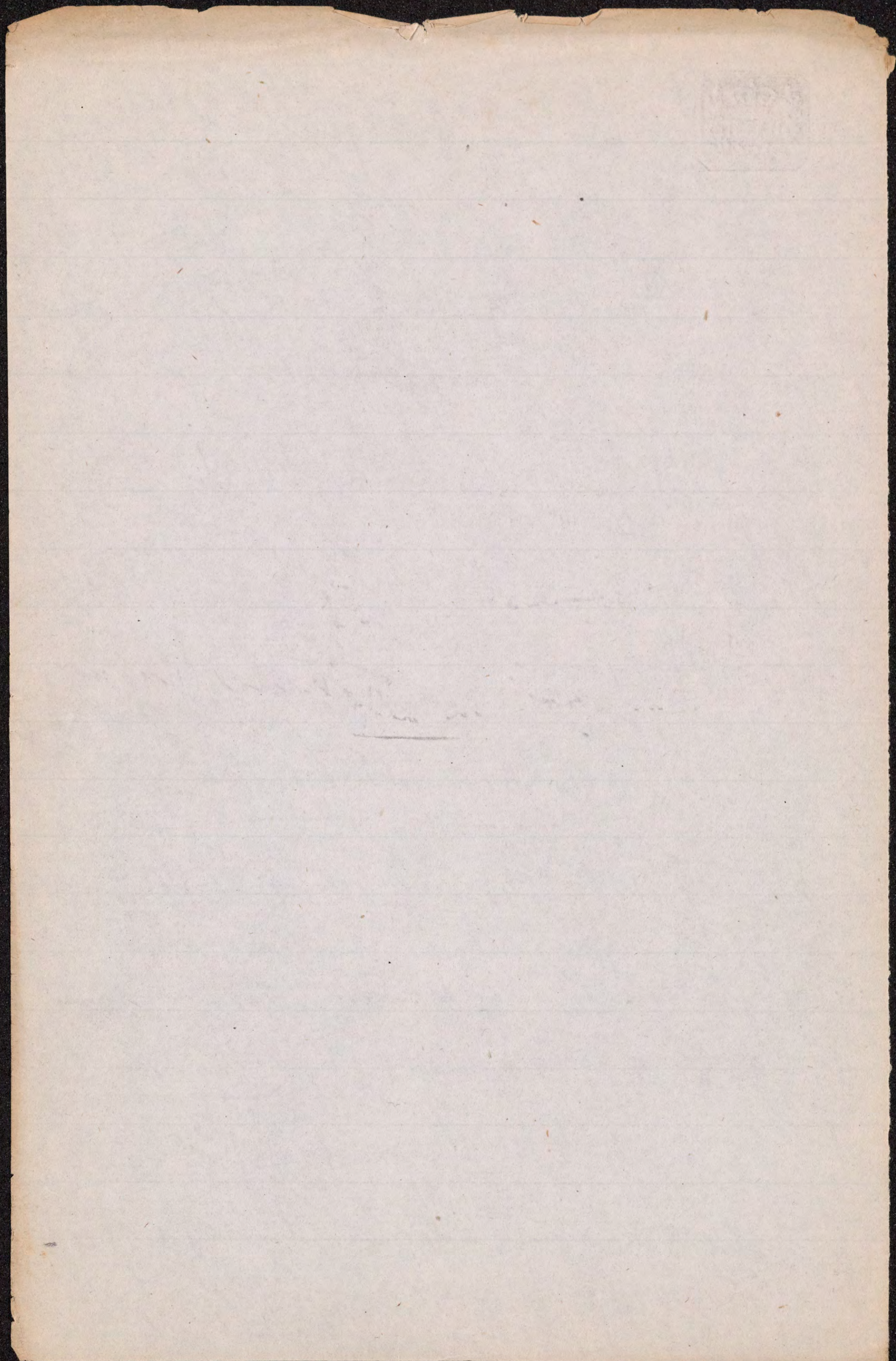
Lead salts also its best
destroyers — an iron shall see

present. — S H, not the cause of
malarial diseases:
(Daniell in Africa).

Carburetted hydrogen —

Heavy & light — the latter the
most abundant natural product —
in marshes & mines — the
heavy an important, the most important in
product in our illuminating gas —

Davy found C H, not much of a
poison — 2 parts to 3 C H transient effects only.
(see pure)



Carbonic oxide from
Coal fires & in our burning gas -
They are active poison -
The blood is of a ~~scattered~~ red
after its poisoning effect. -

Phosphoretted hydrogen much
more rare - the mention of some
analyses of air - it can
produce no important effects in
quantities yet observed in the atmosphere.
Ethereous organic matter - odorous - in close rooms.

Suspended matters in the air

Mineral - chloride of sodium (spectrum
analysis)
Dust of earth - & from manufactures & arts -
sometimes products of disease -

~~Notes taken out~~
from here —

POLLEN AND SPORES IN THE AIR. — Mr. Blackley, the author of a recent English work on "Hay Fever," has been investigating the distribution of pollen and spores in the air. He began with that of a meadow at the average "breathing level" (four feet nine inches from the ground). The observations were continued from April till the end of July. A slip of glass was exposed horizontally, coated with a thin layer of a non-drying liquid. He tabulates the daily results; and the highest number of pollen grains obtained on a surface of a square centimetre in twenty-four hours was 880, on June 28. Sudden diminutions in the quantity of pollen were invariably due to a fall of rain, or to this and a fall in the temperature. Mr. Blackley then proceeded to examine the amount of pollen to be found in the higher strata of the atmosphere. This was done by means of a kite which sometimes attained an elevation of 1000 feet. The pollen was found to be much more abundant at the upper levels than at the "breathing level." Taking the average of the quantities where pollen was present at both levels, he found that while the average for the ordinary level was 24 only, that for the higher levels was 472.33, or more than nineteen times as much. The experiments also afforded abundant proof of the presence of fungoid spores in the air in large quantities. In one experiment which lasted four hours, and in which the number of pollen grains collected at an altitude of 1000 feet was over 1200, the spores of a cryptogam were so numerous that he could not count them. At a rough estimate, they could not be less than 30,000 to the square inch. A fact like this makes the ubiquity of fungoid organisms easy to comprehend.

That these organized contents of air travel to a considerable distance was proved by a series of experiments made in the outskirts of Manchester, but within the boundary of one of the most densely populated parts, and in no direction less than one third of a mile distant from grass land. Pollen was found even here, but the quantity was only about one tenth of that collected in the country.

thus goes on continuously until the lead is all consumed. The gratings of lead retain their shape. When the process is complete the white lead is removed from the pots, ground, washed, and dried, and then forms the dry lead of commerce. For paint this is ground again with about one eighth of its weight of linseed oil, a little Prussian blue, ultramarine, or charcoal being sometimes added to give it a bluish cast. The French process for the manufacture of white lead consists in passing a current of carbonic acid through a solution of the basic acetate; the carbonate is precipitated in the form of a fine white powder. It has, however, inferior covering power.

Recently another method has been proposed in England, which dispenses with the use of acetic acid, and thus promises to be cheaper. It consists in stirring together a mixture of litharge and common salt; an oxychloride is thus formed, which is then decomposed by carbonic acid. The lead produced is said to be equal to the Dutch.

S.

NEW THINGS IN THE ARTS.

A NEW ELECTRIC LIGHT.—M. Ladiguin has recently invented a new plan for electric illumination, which is quite simple, and which, it is believed, may be advantageously used for lighting mines, as there is no danger of its causing explosions. It consists in a bit of charcoal or other poor conductor, attached to a wire communicating with a magneto-electric machine. The charcoal is enclosed in a glass tube, in which the air is replaced by a gas which will not combine with the carbon when the same is brought to a high temperature. The tube is sealed, and the machine set in motion by a small steam engine or other motor, when the charcoal gradually becomes incandescent, emitting a pleasant and quite brilliant light, the intensity of which, it is said, may be graduated at will.

Organic forms

Terms of infusion — spores of
fungous plants — Schrader,

Pasteur, Davaine & ~~Hammond~~
~~many~~ others have discovered these.

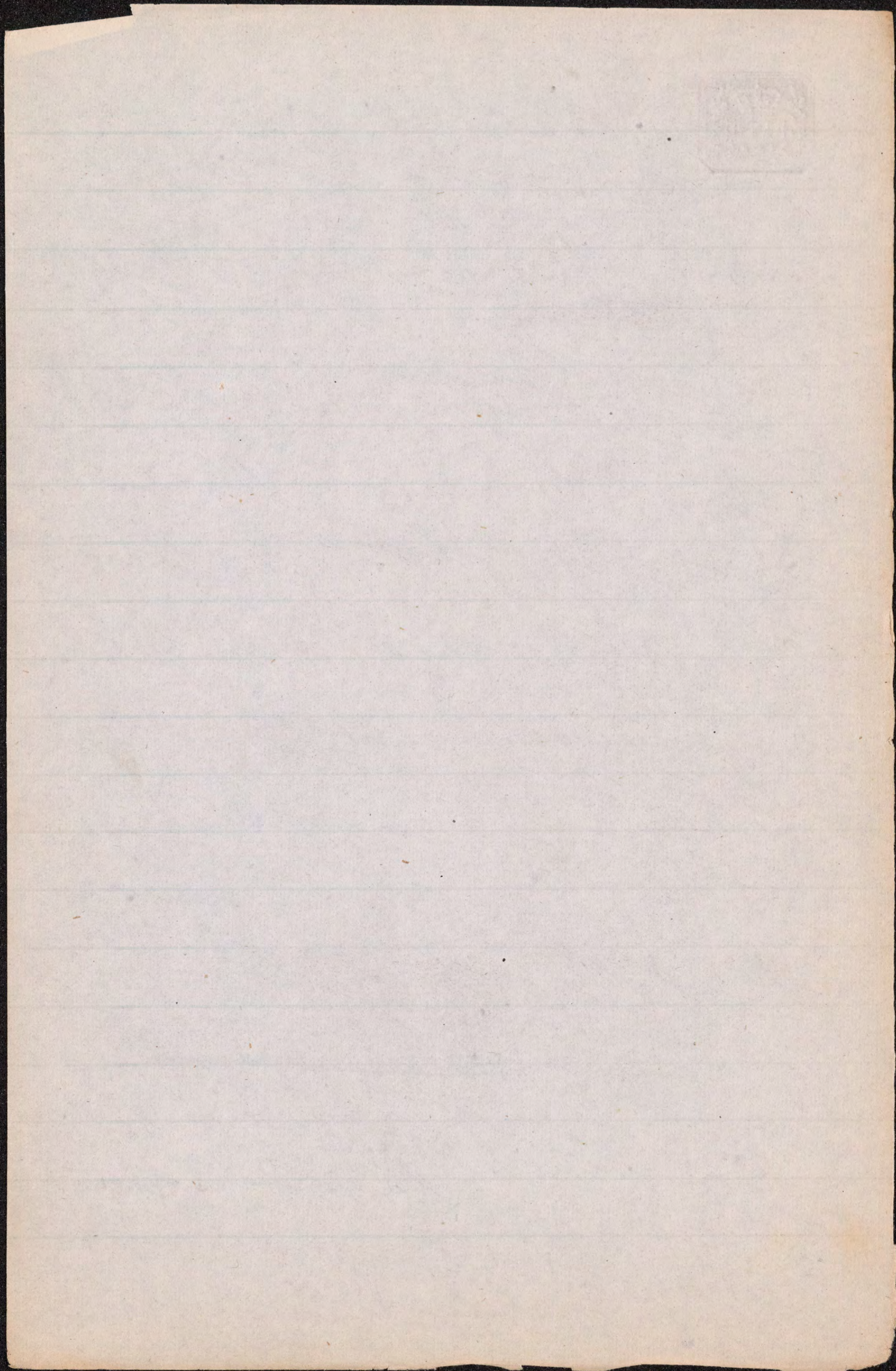
Look at the leaves of lilies
they sometimes make a spot

in a room — you see the floaty
particles — the microscope

would show some of them to be
organic. ^{non-vitalised} ~~starch capsules~~

we breathe living beings — as well as ~~small~~
them by millions: "aerobes" — aerophytes.

Davaine - bacteria in blood of sheep, ~~pleurisy~~
apoplexy — Dr. J. K. Mitchell's fungus theory
of fever —



& Salisbury & measles
further send, a damp straw
~~mat~~ & ~~upward~~ could not

conform —
Cumbrians & then
sleep a damp ^{or mud} straw —

& Salisbury later they
observed upon Malaya
will cause, again benefit
also, Angulitis, gonorrhoea, &c —

Eisel, Pouquet & other
starch capsules, ^{epithelium cells} & in hospital
air — Pus-cells — This infection
contains acids — ^{empirical} ~~sharp~~ ^{gangrene} ophthalmia — Perhaps
sometimes, even phthisis? —

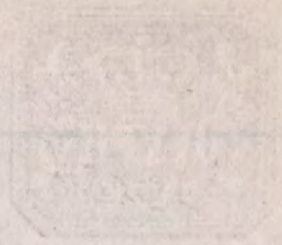


Life origin of Infusoria
in infusoria — (acarus Crossii
Cross' theory — Vestiges
of Creation — Wöhler — Urea —
also —
Experiments ^{have} annihilated (almost)
the idea of spontaneous generation.

Pouchet still holds out
it — & the experiments are
repeated — Donne ^{did} also; Pasteur denies.

Among others J. Wyman of Boston
5 has killed all
kill. then cotton —
red heat —
sulph. acid. —
Diffic. of main-
tenance —

Nature of the experiments
(Raps from all nations — different infusoria)
Present Preponderance of testimony &
opinion — Harry Nyth — omne vivum ex ovo.



Impurities in the Air. — from various causes. —

From respiration:

Excess of CO_2 — ^(in places not thought dangerous) sometimes from 12 to 70 or 80 parts in 10000, instead of 4, which is normal. Still Wills: test. 5 percent may be fatal to man. 10 per cent. common stated.

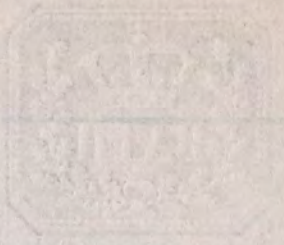
Organic matter — each adult about 30 grams daily. Has when concentrated a Fœtid smell —

Is Nitrogenous — for it forms ammonia.

Darkens SO_3 when drawn thro' it —

(Decolorises permang. potass. —
1 gr Org. matt = 1 gr. Sugar)

Is very strong in odor when, from breath, the CO_2 reaches 1 vol. in 1000.



Dr. Angus Smith estimated the
Organic matter in pure air,
— 1 gr. in about 200,000 ^{cub. ft}

In a house — 1 gr. in 16,000 to 64,000

Closely packed railway car 1 gr. in 8,000

House having sewer and entering it — ditto —

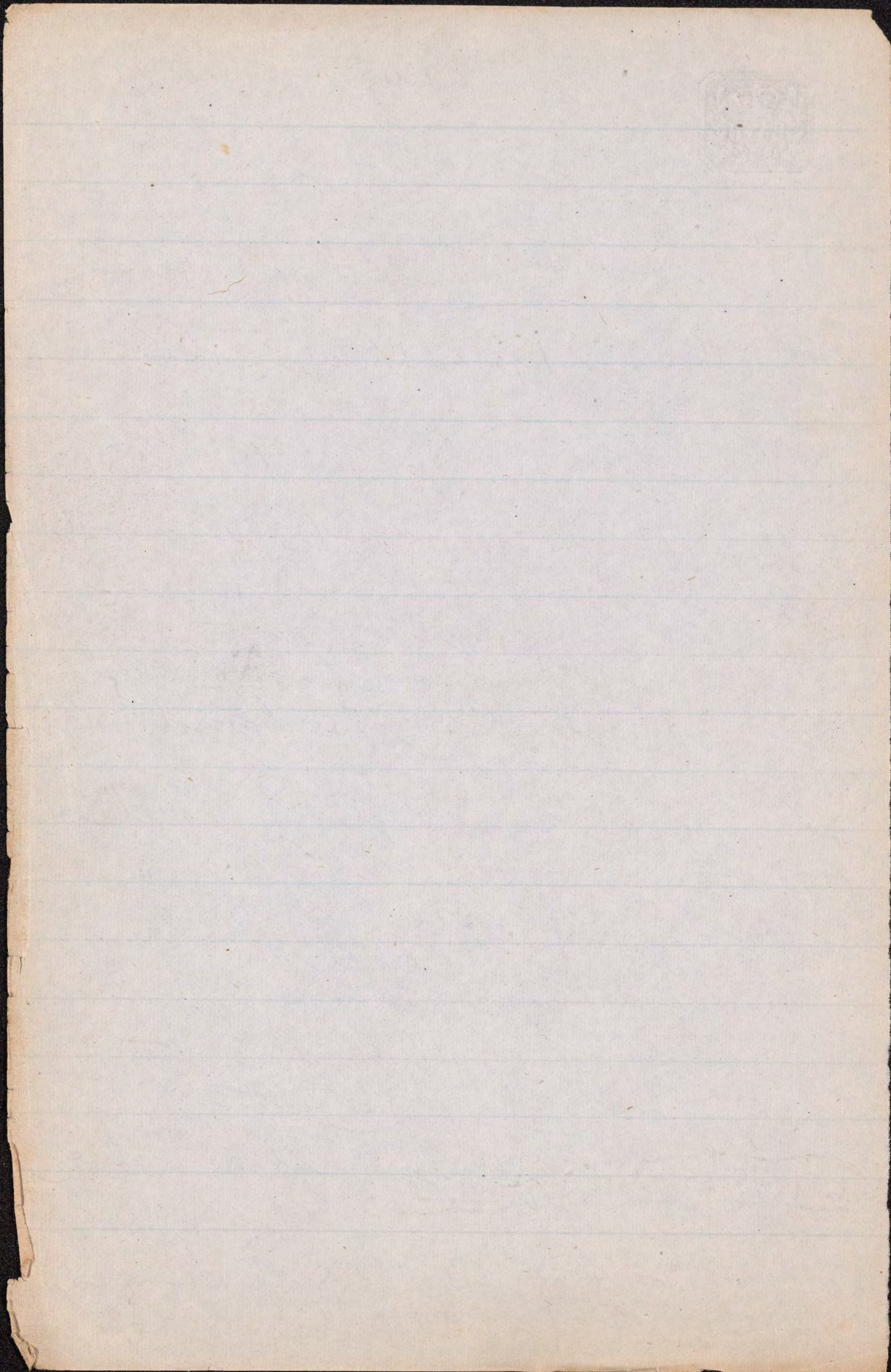
Effects of air contain. by resp.
not confined to rare instance of fatal
Dangerous asphyxia —

Headache & faintness at the time:

Typhus fever —

in 1577 — 500 deaths "Black" assizes —

most remarkable in 1750 — when 4 judges
several councillors, sheriffs, jurymen — in all
40 — died of fever from trials in close room



Jail fever — Ship fever —

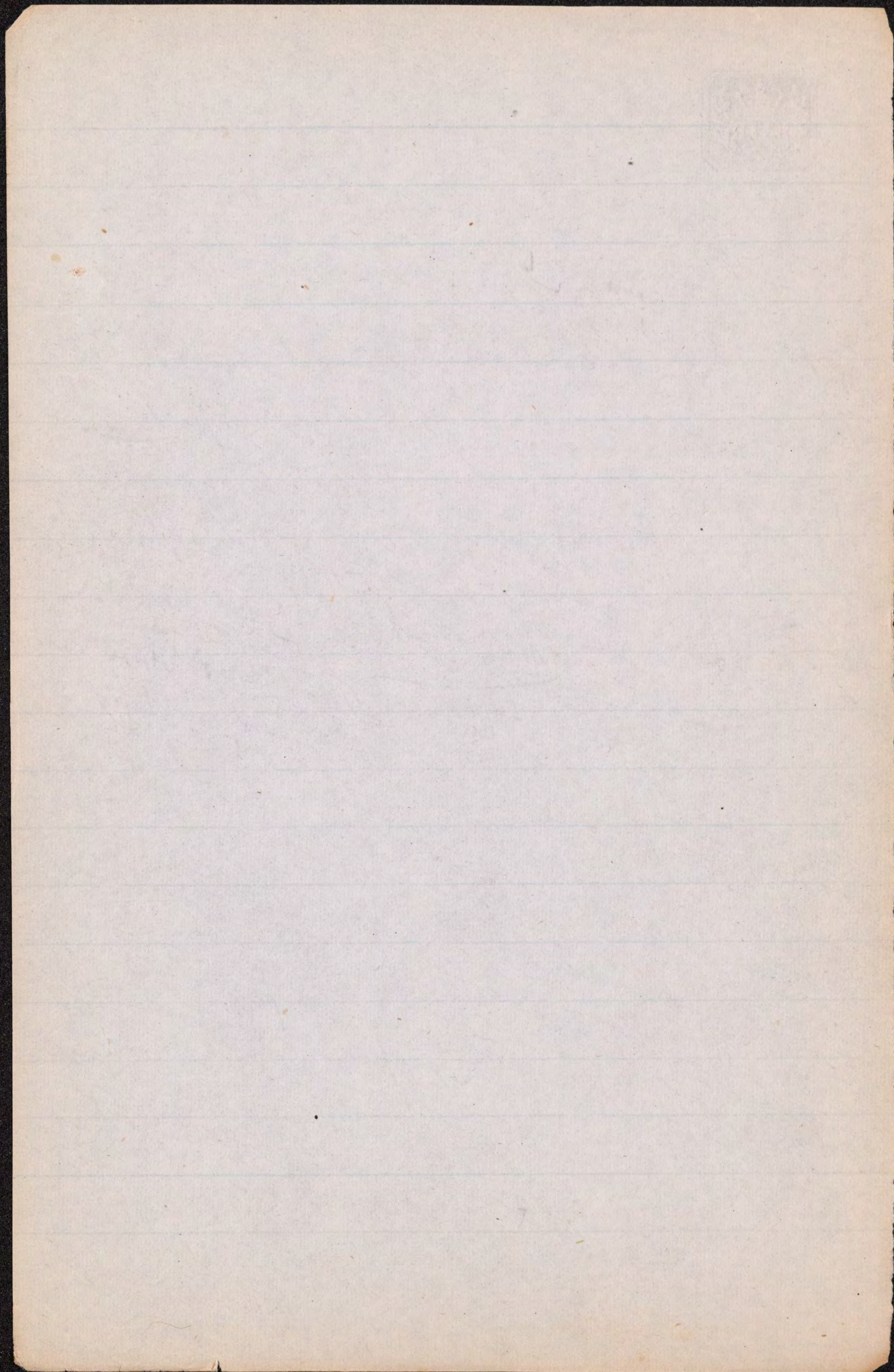
Camp fever — not ours —

^{crowd poison}
^{"ochlesis"} | typho-malarial —
Typhus then contagious: some English au-

thorities now say so always —

X "specific poison" or "pythogenic"
origin of Typhoid also ^{caused by} ~~caused by~~ ^{Ammonium}
this, as the rule, doubtful.

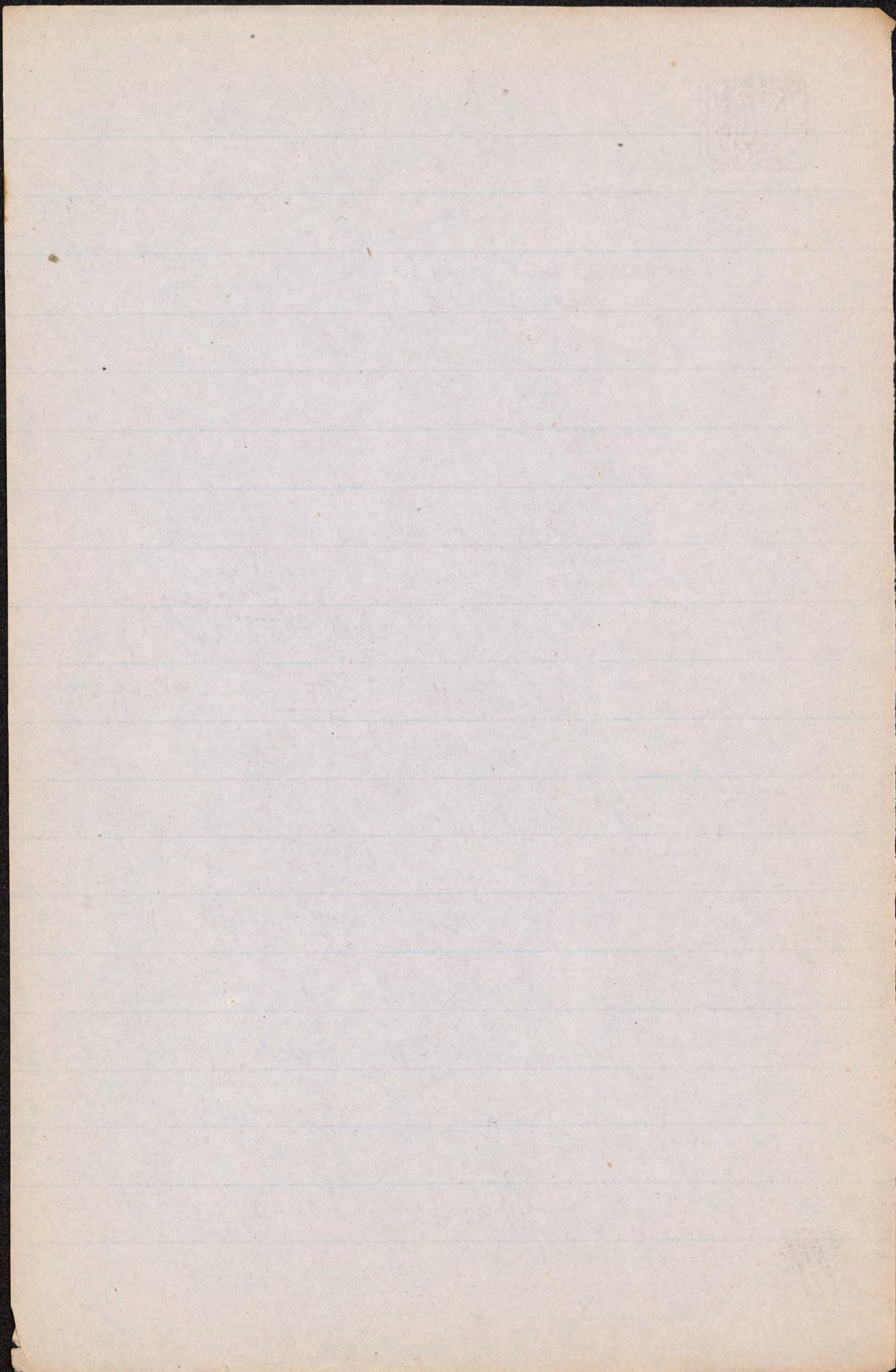
Amount & mortality of all zymotic
diseases increased greatly by ill
ventilation. This especially among
children — In one found J. hos-
pital ^{in London} with 7000 children in 4 yrs —
2000 died — in another 4 yrs,
after good ventila., — only 300 died —



Dr B. W. Richardson mentions
a case where scarlet fever at-
tacked a family in a very low-roofed
thatched cottage — when one child died,
he had 3 removed — in a week
or two one came back — & died
also of scarlatina — ^{later - another also} thought all had
been well cleaned & whitewashed —
I have known it recur after months intervening.

Beaujon Hospital Paris, in a
healthy quarter, has 4 similar pa-
tients. 3 of them had, in 1851-2,
erysipelas & hospital gangrene, &
large mortality; the 4th, not. Only
difference, good ventilation in the latter.

The quarters of this city — &
every city — in which scarlet fever,
measles, small pox — typhus & cholera



will always be worst, in number
of cases & still more deaths

Can always be pointed out by

any one ^{Sanitary} experience
Relapsing fever, 1870, Alaska ^{street} improvements in New York ^{from} 1868-9 &
Sanitary

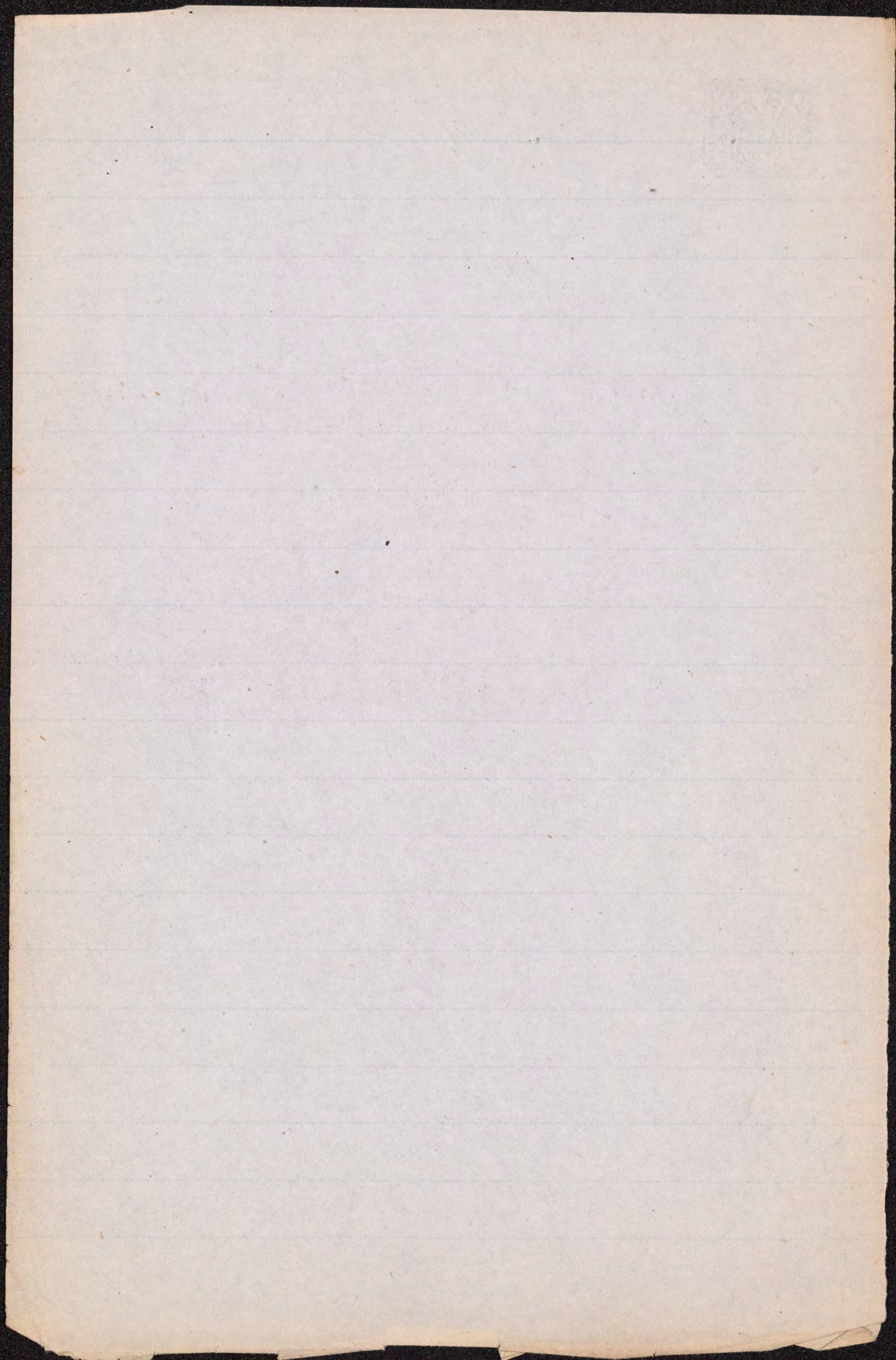
Pulmonary affections

also — & especially tuberculosis,
seen to be promoted by close
atmosphere more than by most
causes. ^{The great frequency of} This is the British Royal

Navy is so accounted for by Dr Bryson;
Dr Greenhow & others have similar

view in several parts of Great Britain.

^{Banquet, Sargol in France.}
^{into the atmosphere}
Exhalations from the sick
are decidedly worse than from the well.

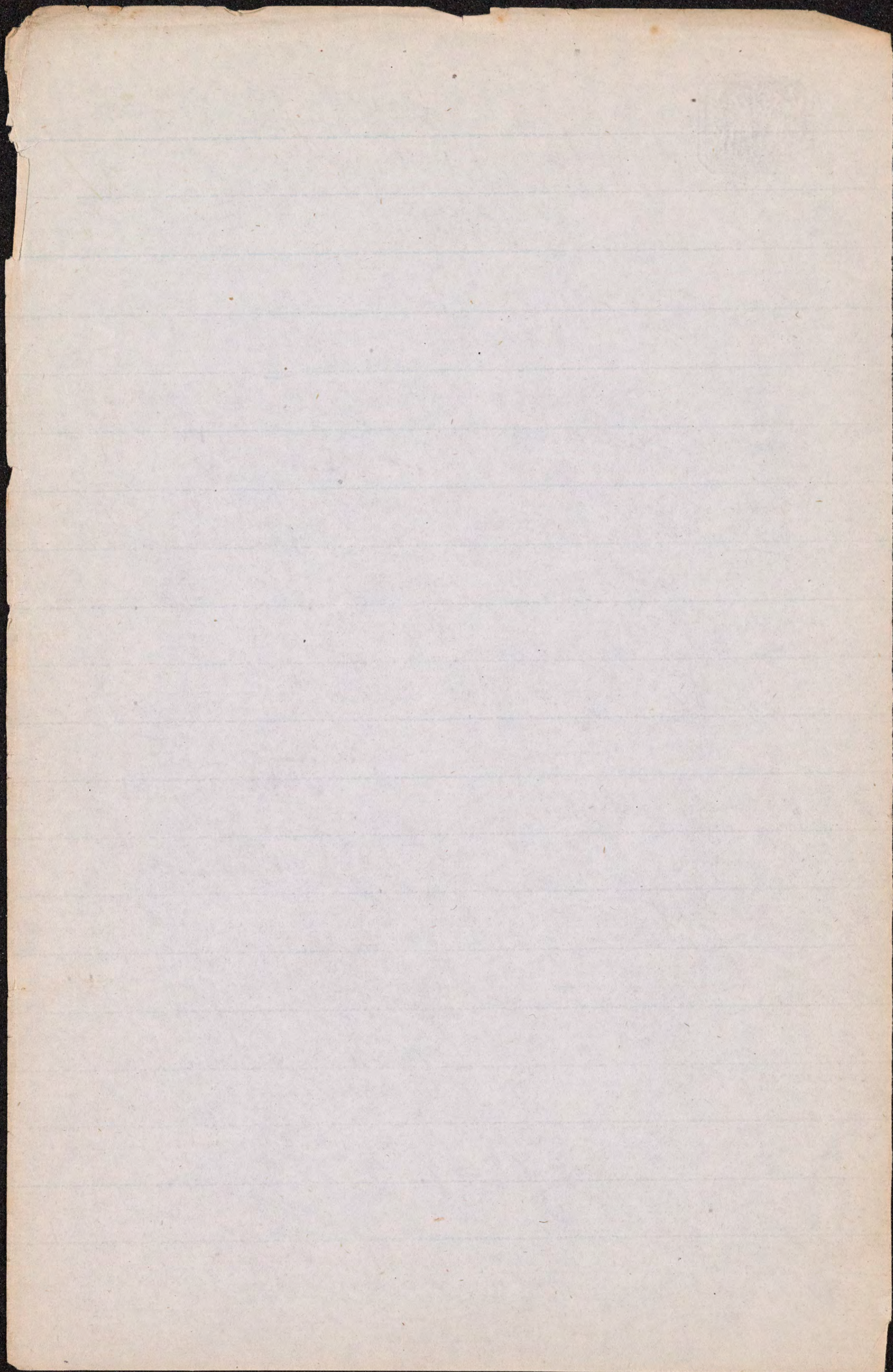


State of the system makes
a great difference in sanitation.

A human — urine be —
I have sketched flies more about
a very ill person in Hospital and
in summer

Bequeathed about sewage
from a very poor & unhealthy quarter
more offensive — no doubt more deleterious.

Sometimes very hard to get rid of
emanations from the sick, especially with
infectious diseases; — the foul organic
matter being absorbed by clothes, bedding,
furniture — by walls & ceilings.





New York City Hospital
as Dr. Hammond states had, in one
ward, hosp. gangrene of leg.

Patients were removed, — furniture
changed — all ~~thoroughly~~ cleaned
disinfected. others placed there
— the same again. Then plaster
scraped from walls & removed; — but
same again. Then pulled down
rebuilt — & safe.

May have been for improvement in
ventilation — as in Dr. Harlow's
case in Nashville — when hospital
gangrene was annihilated by skylight
& ventilation opened in a ward



The experience in Penn
Hospital, Obstet. ward on
Spruce street —

now I believe closed permanently

In Vienna, a similar obstetric
persistence of puerperal fever
has been described. —

Tent. Hospitals —
(Billings) temporary
ones —

Material of beds & of walls

beds — therefore important. —

as water vapor is repelled;

Organic matter is absorbed most

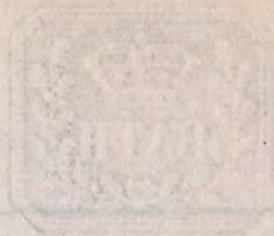
by wool, feathers, damp porous walls

& moist wall paper; least by

straw horsehair, — dry smooth

hard walls. Painted walls will

do well only if very smooth & even, not
as sometimes in cracks.



Whitewash, after rendered and
better than rough walls or wood.

Calceining of Parisian Cement
or soluble glass — as stone
the best —

Duct of a ward at St. Louis
Hospital Paris found by Chalvert
to contain 36 to 66 per cent of
organic matter, smells like
horn when burned —

Purulent Ophthalmia one of the diseases
considered to be spread by pus-cells
— to which allusion has been made
before —

Tyndall - Duct & Disease - (Lancet, April 1870)

~~Notes taken out~~
~~from here~~

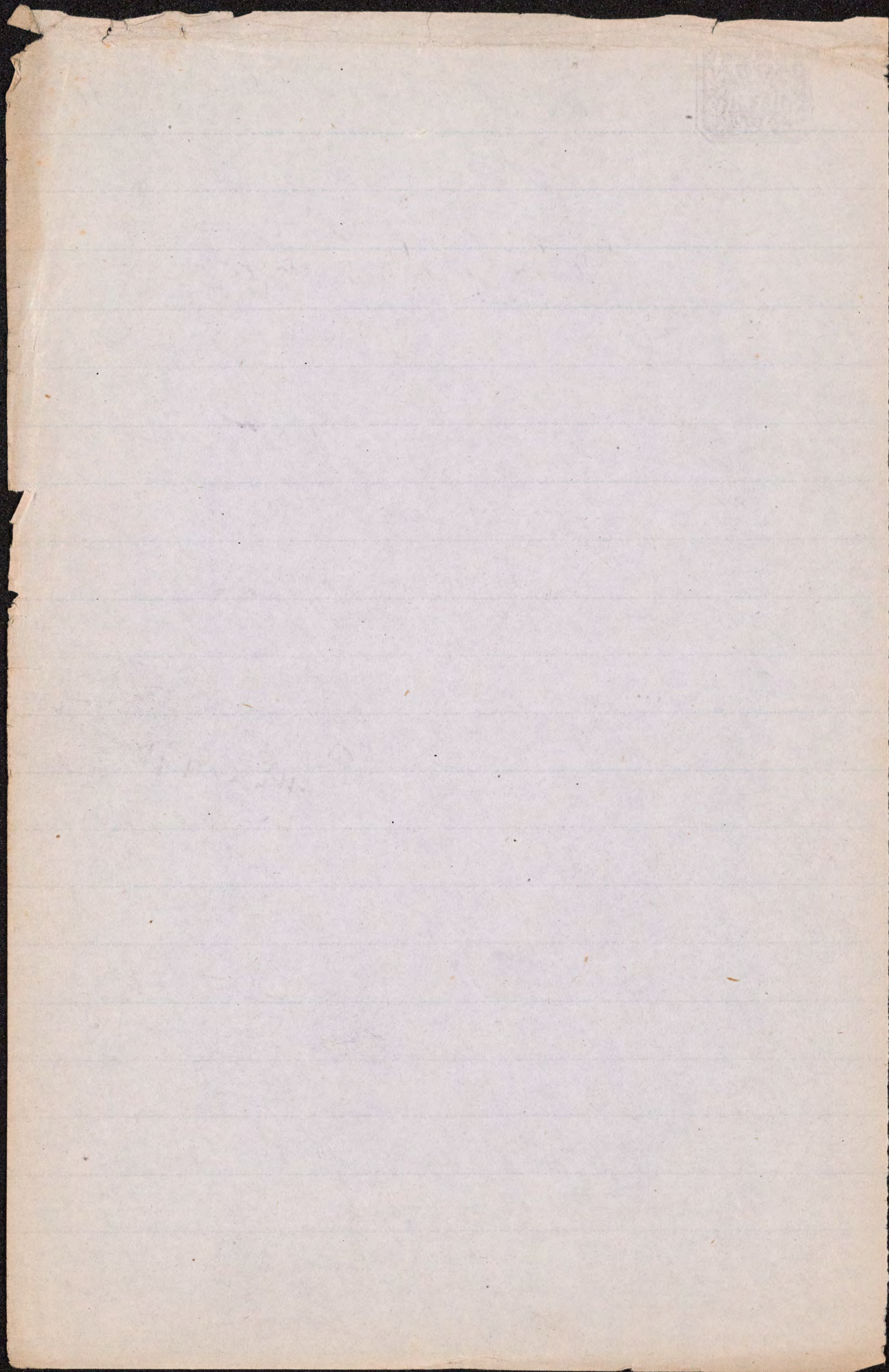
(1 lb coal demands for complete
combustion 240 cub ft of air.)

Combustion vitiates the

Air — An oil lamp will consume in an
hour the $\frac{1}{4}$ of about 3 cub ft of air & make
Carbon and chiefly CO_2 —

also solid carbon — $\frac{1}{1000}$ part
of coal goes off so — In London
this makes the fog so opaque
that in 3 weeks I can see
but once, in winter — can almost
cut the fog — particles ^{of carbon} can't get
even when no fog by Pouchet's aerometer
— but not higher than 600 ft —

The CO_2 is diffused over
town pretty fast — not much
constant excess of air in of
Paris — in London & Madrid & Valencia
found nearly 8 parts in 10,000 —



Other products of combustion
when burnt are CO - SO_2

SO_3 , Sulphuret of Carbon -

Sulphuret of Ammonium - &
water -

From some manufactures
these worse things - as are

several fumes - as are

Concentrated

Mint - Nitrous fumes -
even scattered last.

For combustion, 1 lb coal

requires 240 cu ft of air -

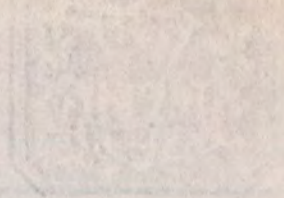
a common lamp, over 3 cubic ft of
air per hour -

Gas contaminates air
more in proportion -
not all burned.

Headache & oppression - leading

to bronchitic affections - & even

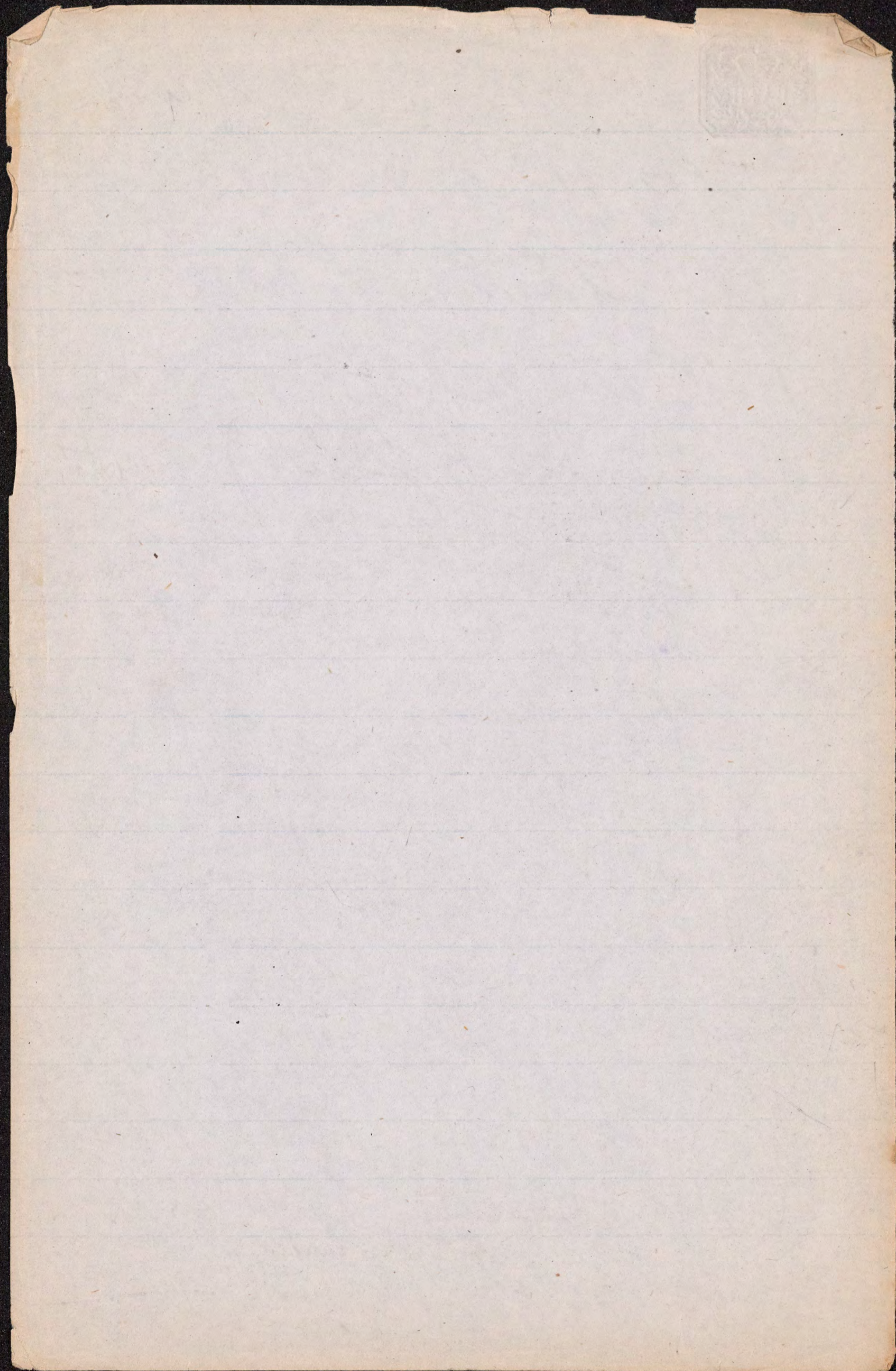
anemia ascribed often to effect of combustion
in air not enough renewed



of course
Sewage gas makes a very
bad contaminant of air —

157 $\frac{1}{2}$ cubic inches of gas per
gallon per hour (Lethely) — containing
carbonic acid, sulphuric ammonium,
sulphhyd. & carb. ammoniacal
— with deficiency of oxygen.
organic vapor

Cases of rapid asphyxia are
on record — first sudden opening of old
pring mills & cess pools — In one
instance in England 23 children at once
near where a pring was closed out an
attack with vomiting, purging, headache
& convulsion twitching — 2 died —
I saw one case in a man. myself
same children as caused



As to the general un-
wholesomeness of the location of
sewerage cleaning — statement

differs — many say sewer-men
are especially liable to typhoid &
typhoid ^{ophthalmia} (Bacillary) but the exceptions
are so many as to show that they
often grow immune to the acid
poison. — (Victor Hugo)

Where openings from sewers
are near houses — much harm to
health may ensue —

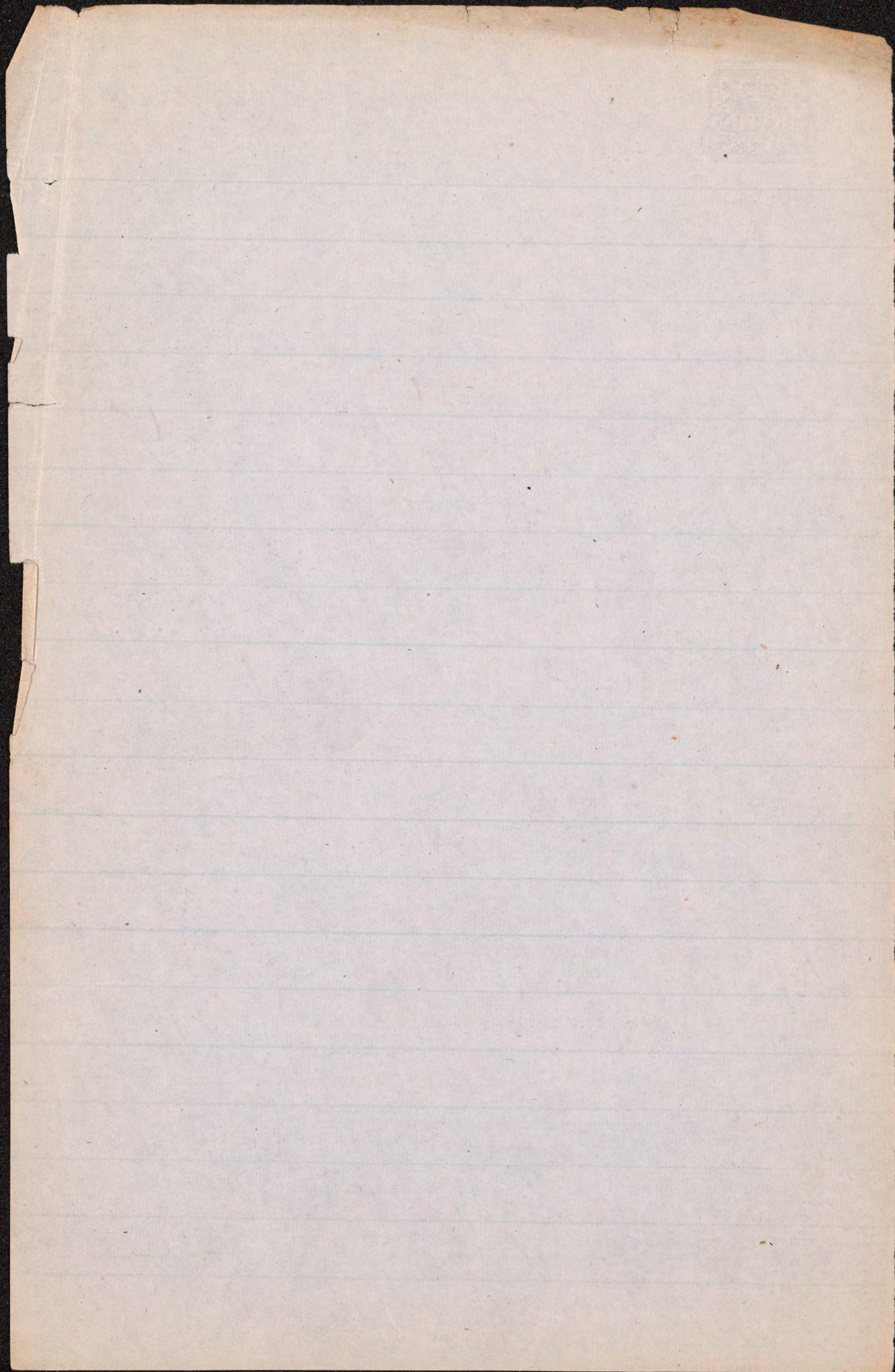
National

Hotel

Many instances are
mentioned of Dr. Parkes & others —

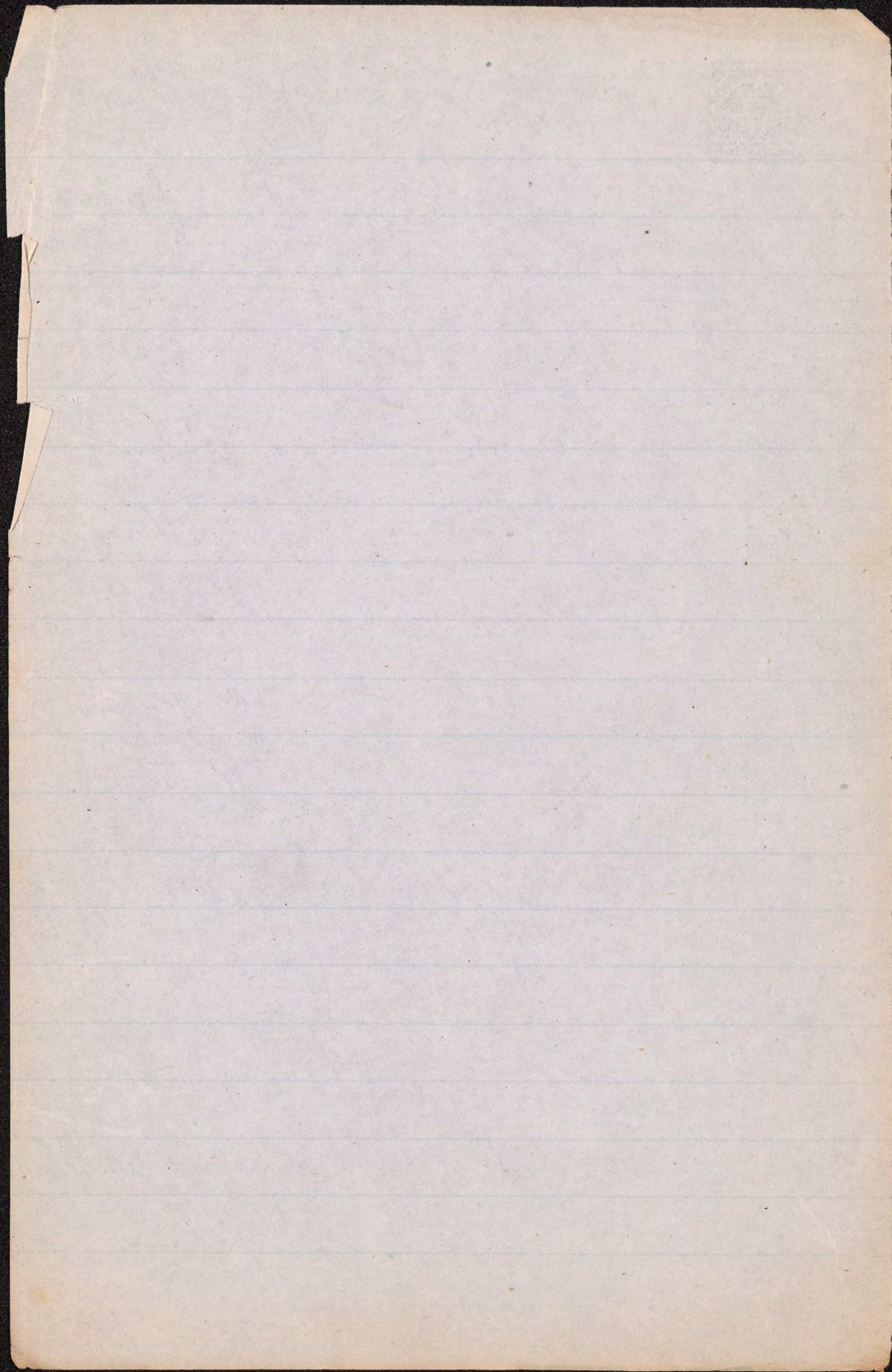
diarrhoea ^{suppurative} malaise — debility

various — among the effects



How far Dr Murchison
is right in believing such emanations
the especial and almost
sole cause of typhoid ^{I have said} fevers ^{Must}
remain doubtful — That
fever so often occurs in best
open healthy places & the
cause — ^{Special person?}
^{Dr Budd}
I am not convinced of it at all
Dr Christison of Edinburgh
denies it there.

Senary gas is capable more than
other foul air of promoting cholera, &
scarlet fever & other zymotic diseases
& other mortality.

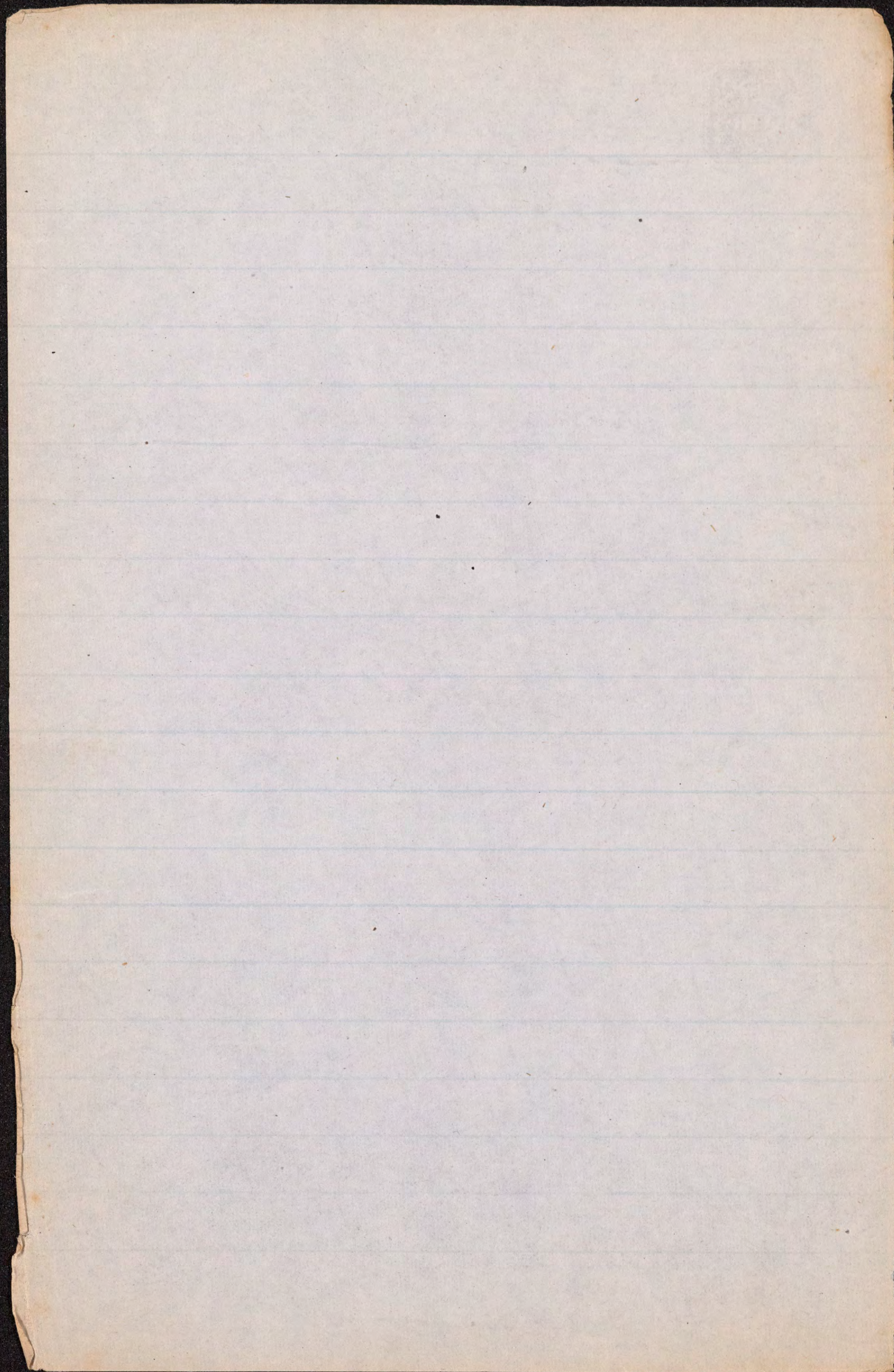


Accid matter than in the
ground ^{arises} ~~arises~~ the air, & though
least in the dust —

As for streams sewer
sewage must be unwholesome

But, Parliament almost done
for Westminster Hall by Thames —

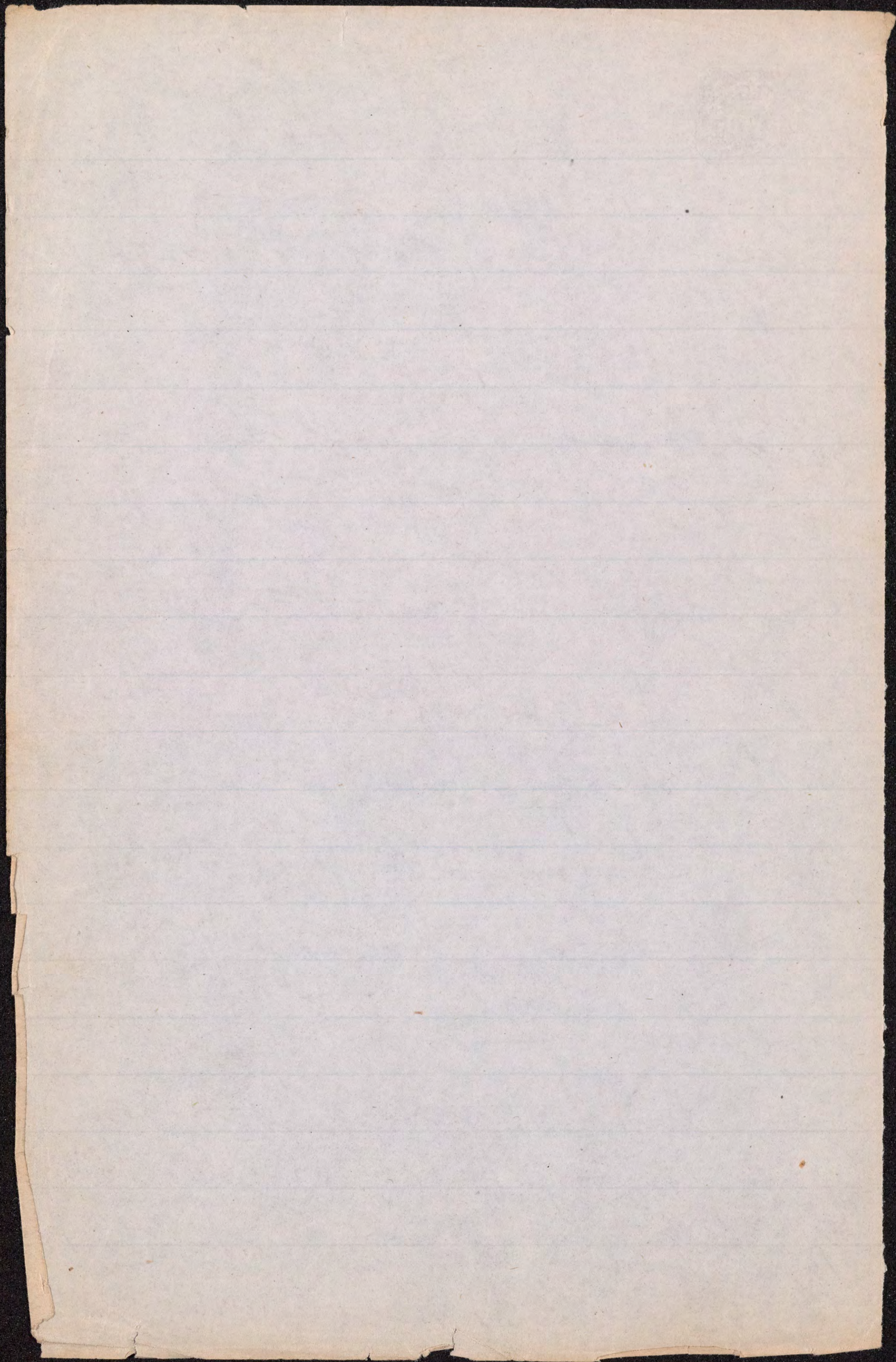
Promotion of Cholera in direct
proportion to use of it by people for
drinking has been mentioned already
— It is likely that their vicinity
to the river which led to bad water
supply may have also acted
thru the air —



Making of poudre for
facial matters does not seem
to be specially injurious to
health — I suppose for
the speed & simplicity of the
materials used —

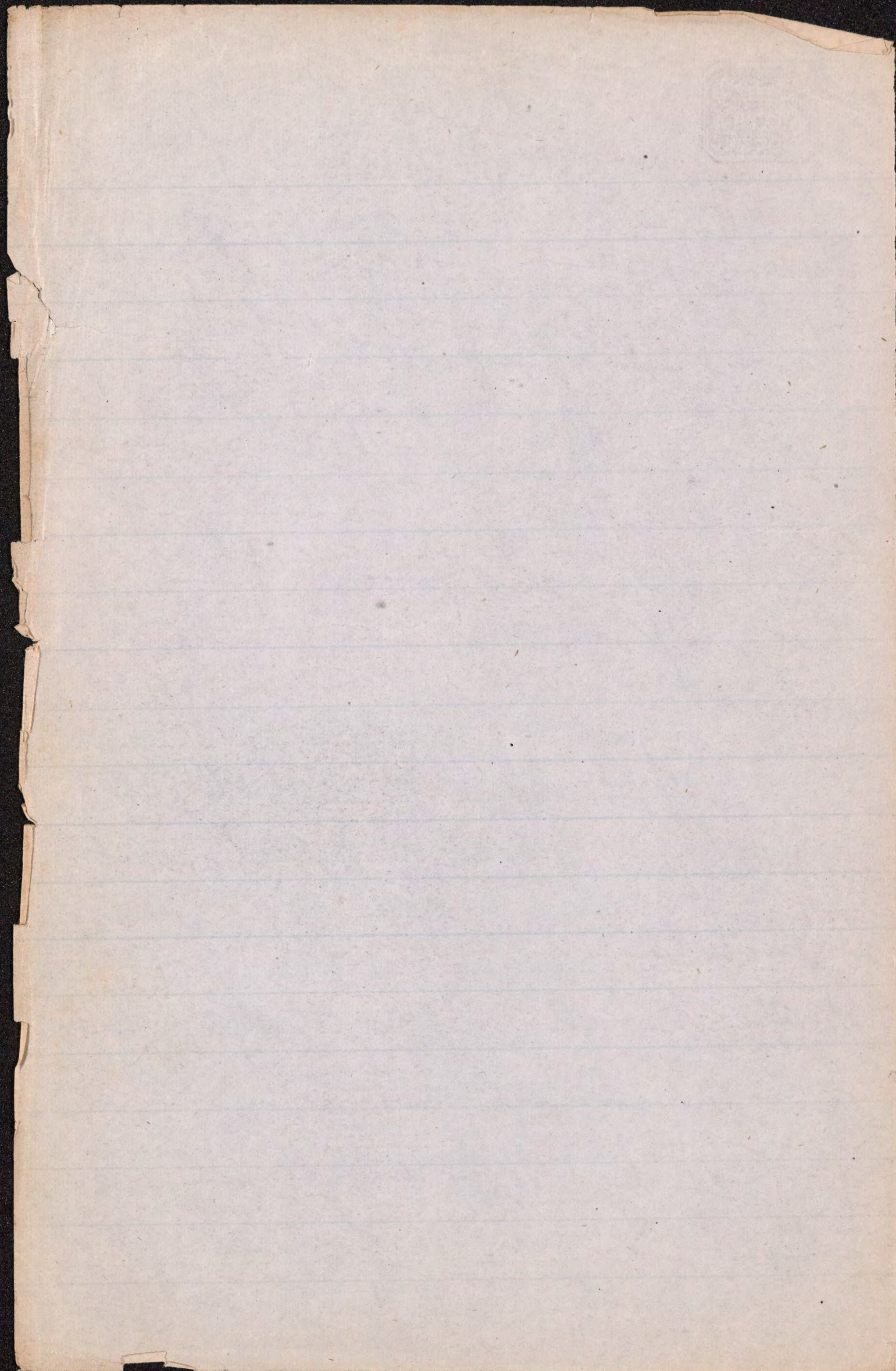
Decomposed poudre — in
small space — as common on
ships — has been productive of
fatal disease — vomiting — prostration
Diarrhoea —

Air of graveyard is
somewhat evidently unwholesome to
those living near or working about
them — Cholera & other diseases more fatal there.



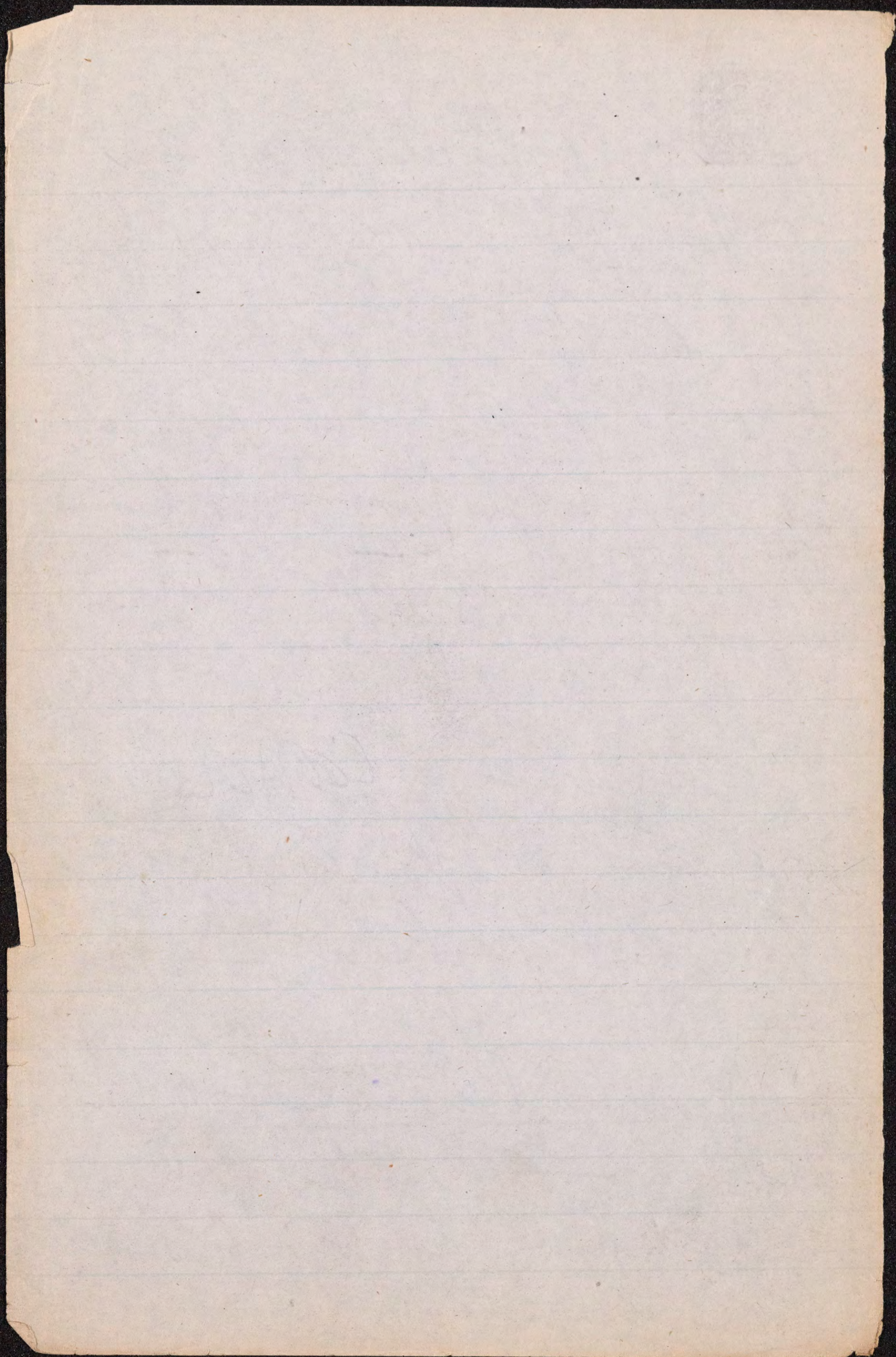
Influenza from decomposed
animals — or about slaughtered
horses — experts to be very
unfavourable to health — does
not so often give examples of
that influenza as would be anticipated
etc

Horses killed in battle make
while left unburied a horrible
stench — My acquaintance with
it after the battle of Gettysburg ^{has} left
an impression not to be forgotten —
It must be very unwholesome — At
Sébastopol it was so obvious to the British
front camp — P. M. & other English authorities
have recorded the same —



Art of Brickfield,
which often smells bad,
is, of course just as it comes
from the kiln, even fatal.
Its exact compo. is not known
chiefly CO₂
No considerable influence around
its action — its tendency

Bad smell of ~~CAN~~ ~~the~~ ~~works~~
bone burning & glue works etc etc
indicates insalubrity — but
should never be allowed near a popu-
lar place — but isolated for a
distance — & their foul gases
might to great advantage be most
burned up in their own furnaces

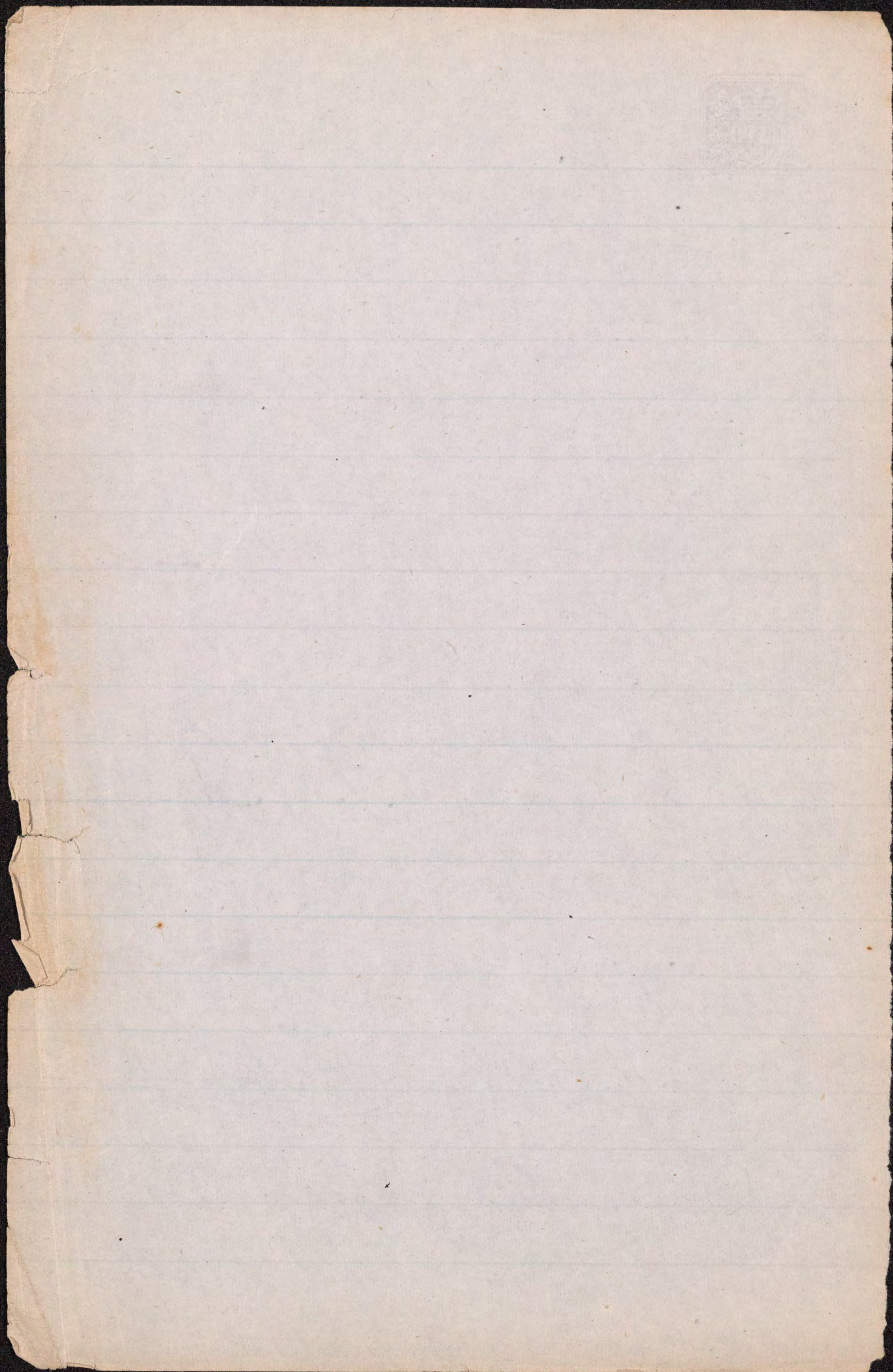


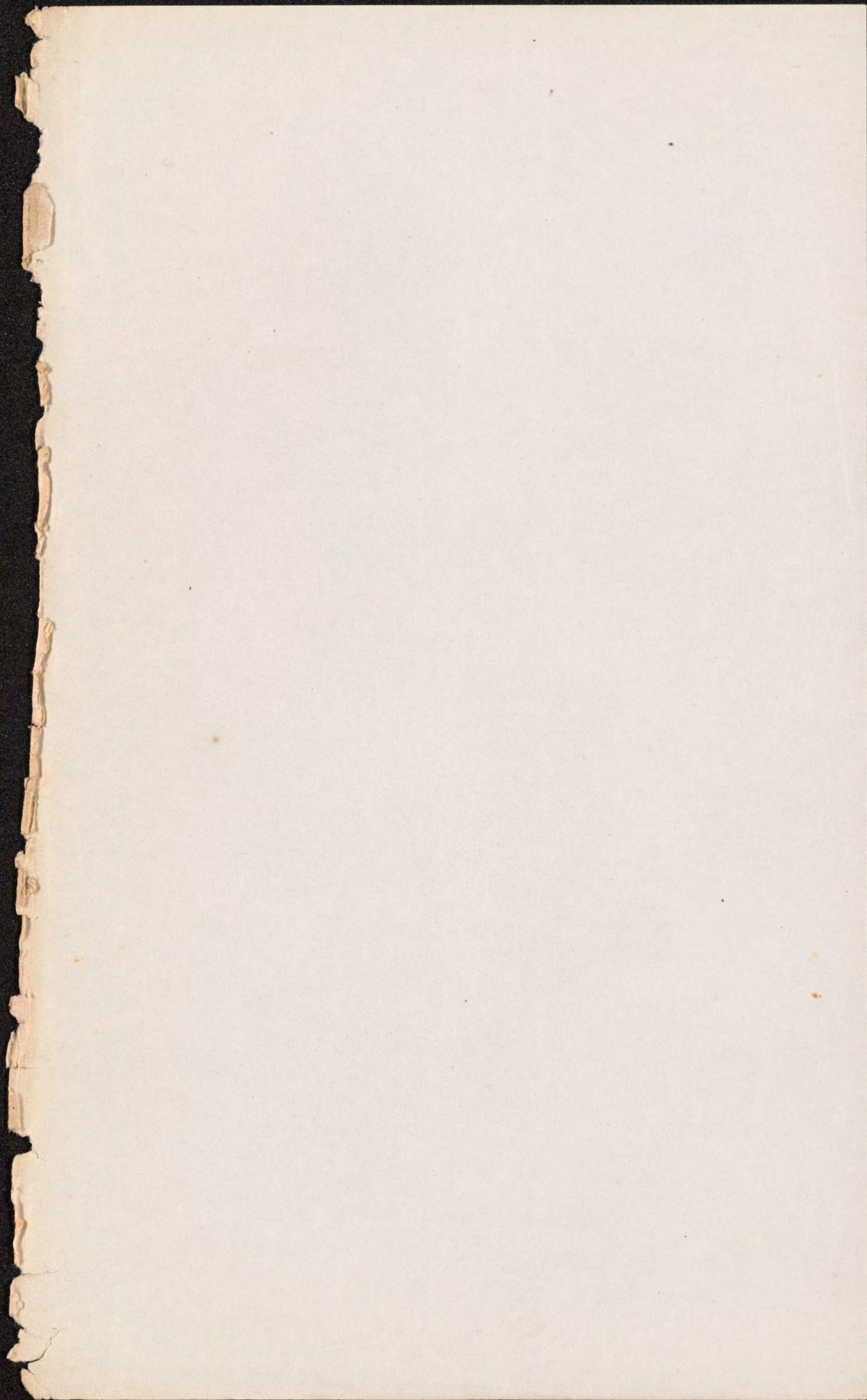
(Now, how to remove or
avoid the effects of all these
contaminations of the atmosphere
is a great question —

First, to prevent when
possible the existence of these
Sources — is of course most
important — the prevention of
nuisances — which is a part
of the application of public
hygiene —

Next Ventilation —

No disinfecting process will
take the place of that — all would
do more harm than good if confidence in them
led to neglect of ventilation

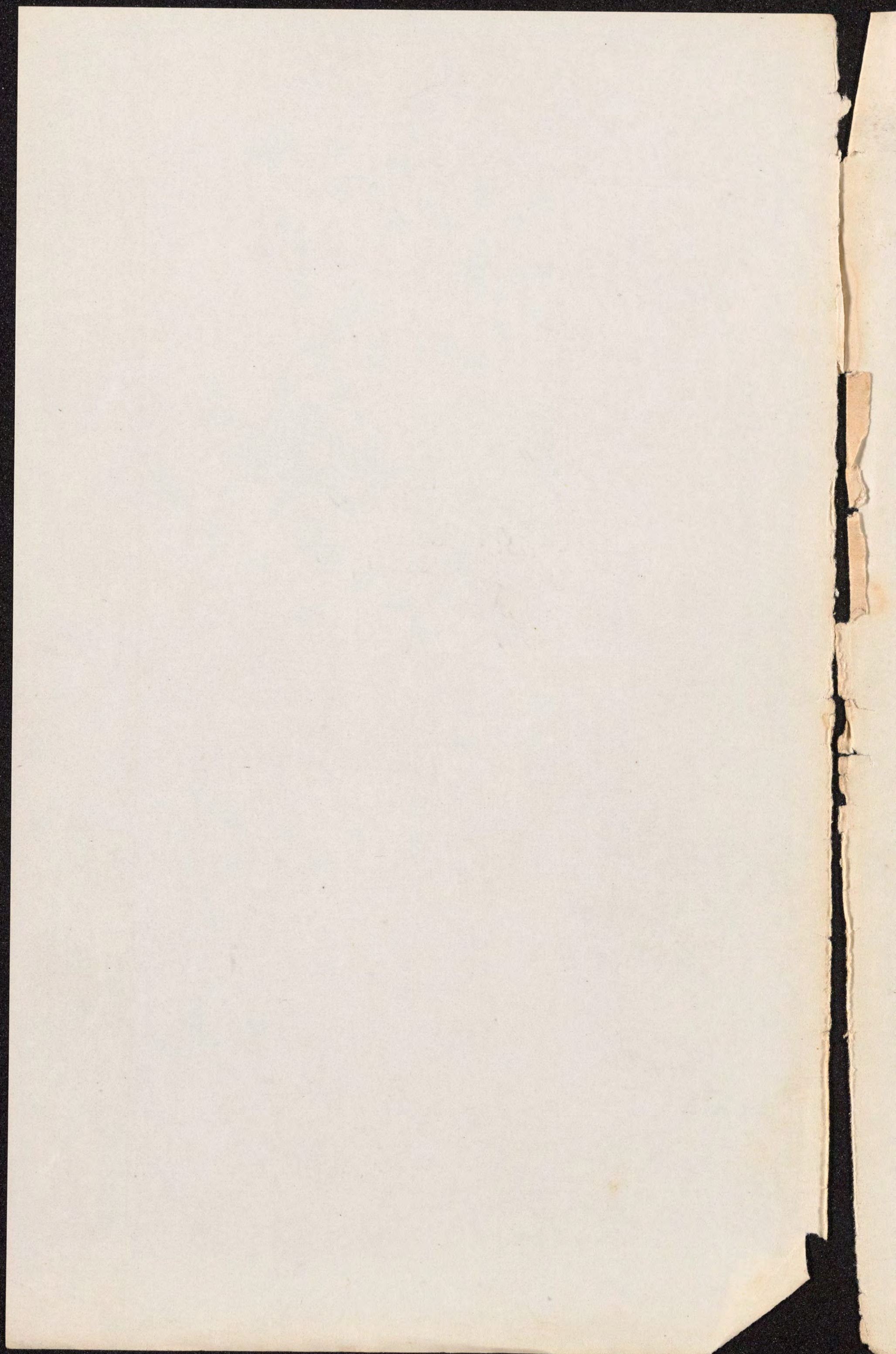




Next Disinfection.

Disinfection before this

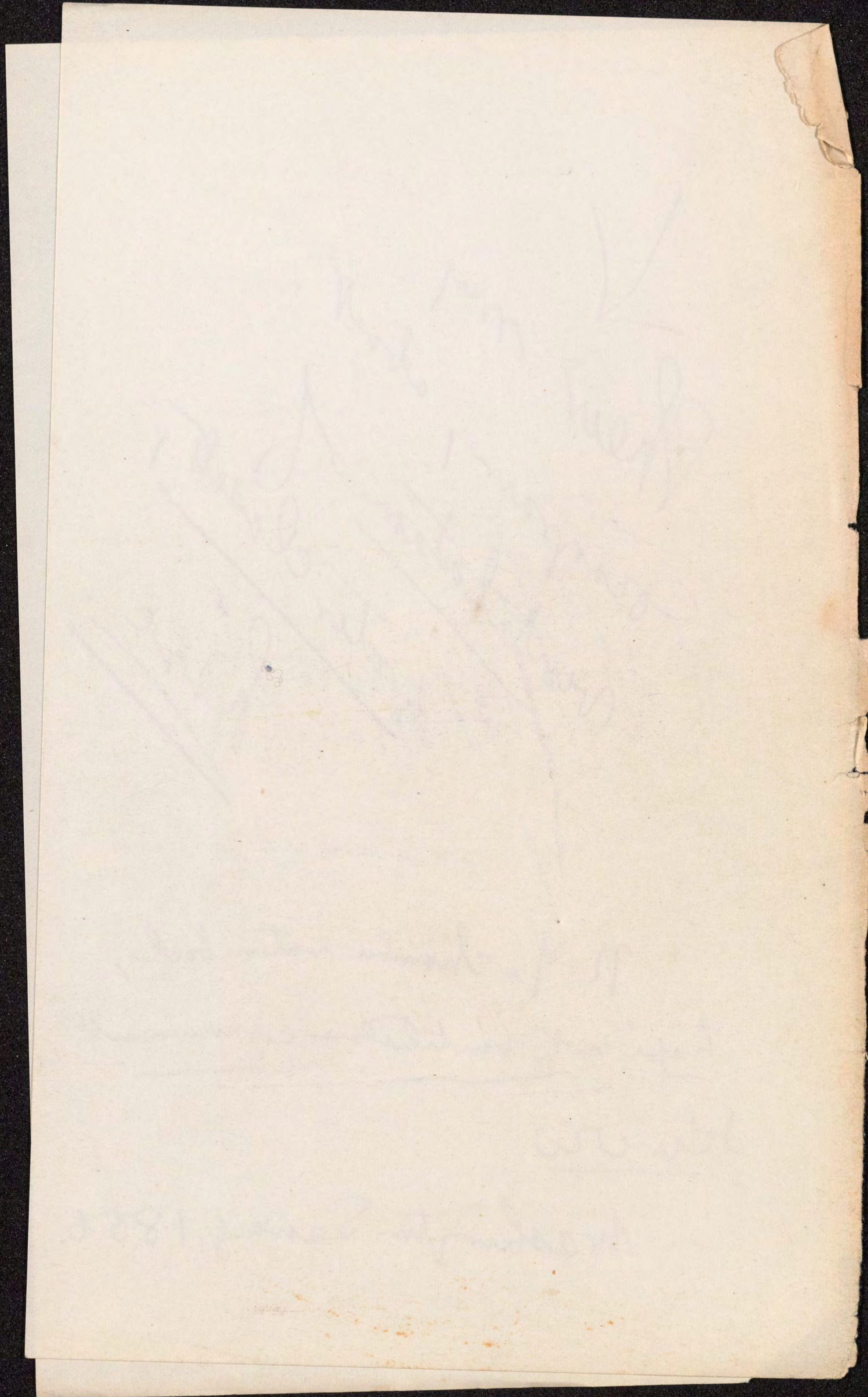
Hygiene of
Habitations.



↓
Show my about
Diagram of
ventilation of
water closets,
here

N.Y. Chamber water-bowl,
traps not ventilated — common with
sewers.

Washington Sewers, 1856.



Hygiene Of Habitations.

2

1. Site, dry and not malarious.
2. Enough sunshine without glare.
3. Abundant ventilation.
4. Good water - supply.
5. Drainage and sewage removal.
6. Construction for dryness of foundation, walls and roof.

7. Heat during cold weather.

Causes of ~~Change of~~ ^{Atmospheric Movement} Air

1. Diffusion of gases.
2. Diversity of temperature in upper and lower strata of atmosphere.

3. Artificial appliances.

Modes of Ventilation.

1. Natural, or spontaneous.
2. Artificial or compulsory.

Use of Disinfectants.

(17)

Chloride of Lime — Solid; or,

1 pound to a gallon of water.

Sulphate of Iron — Solid, or
1 pound to a gallon of water

Chloride of Zinc — Burnett's
Liquid (25 gr. in fl. drachm)
a pint to a gallon of water.

Chlorinated Soda (Labarraque's)

a fluid ounce to a quart
of water.

Permanganate of Potassium (Condy's)
~~1/2 pint to the quart of water.~~

~~1/2 pint to the quart of water.~~
1/3 ounce in a gallon of water.

Carbonic Acid, 1/2 fluid ounce to 1 fl. ounce,
in a gallon of water.

Nitrate of Lead (Ledoyen's) — 1 pound litharge,

288 70% Nitric Acid & 2 gallons of water.

Salicylic acid, 1/2 drachm to 1 1/2 pint of water

The subject of the ^{continuous} renewal
of the atmosphere, — or ventilation,
brings up, as connected with it,
the topics of Heat & Light;
which make up ^{with air} the vital conditions
of habitations. We may ^{therefore} best
consider all of them, now, under
the head of the

Hygiene of Habitations.

The essentials for health of human
dwellings, — whether private houses,
hotels, hospitals, barracks, or prisons,
are — as they are stated by the late
Professor Parkes, in his Treatise, —

1. Situation.

2. Construction.

3. Light.

4. Ventilation.

5. warmth.

6. Water-Supply.

7. Drainage, & Conservancy.

8. Population.

9. Homes of the rich.

10. Homes of the Poor.

B W Richardson's Hygeia

Pettukofer on Air-Movement

Waring on Drainage.

(chiefly follow Parker, p. 254)

1. A Site, dry and not malarious or insalubrious from any cause —

2. Enough sunshine, for health & cheerfulness of aspect —

3. Abundant ventilation.

4. Drainage & waste removal of all kinds, prompt and complete.

5. Due supply of good water; ~~if removal of its waste~~.

6. Construction of the house so as to maintain dryness of foundation, walls, and roof, —

7. Heat, during cold weather, ^{or very damp weather (windy & green fire in summer)}

~~Notes out from here~~

As to Site, - a hill-side,
not too steep, - on the slope
which looks towards the South
&, in our climate, the West. -

our pleasant summer breezes are
from the West; chilly wind north
& East: - all that depends ^{of course} on
country. Climate in different parts
of the world.

Soil is important in a
situation. It acts by its absorption &
radiation of heat, -

by reflection of light -
absorption of water - & movement

○ PETTENKOFER has shown that a cubic foot of soil contains one-third of a cubic foot of air. Now, according to Boussingault, the amount of carbonic acid in this air is much more than that in the atmosphere. He found that in a field recently manured it amounted to 221 parts in 10,000 of air; in a vineyard, 96; forest-land, 86; loamy subsoil, 82; sandy subsoil, 24; garden-soil, 36.

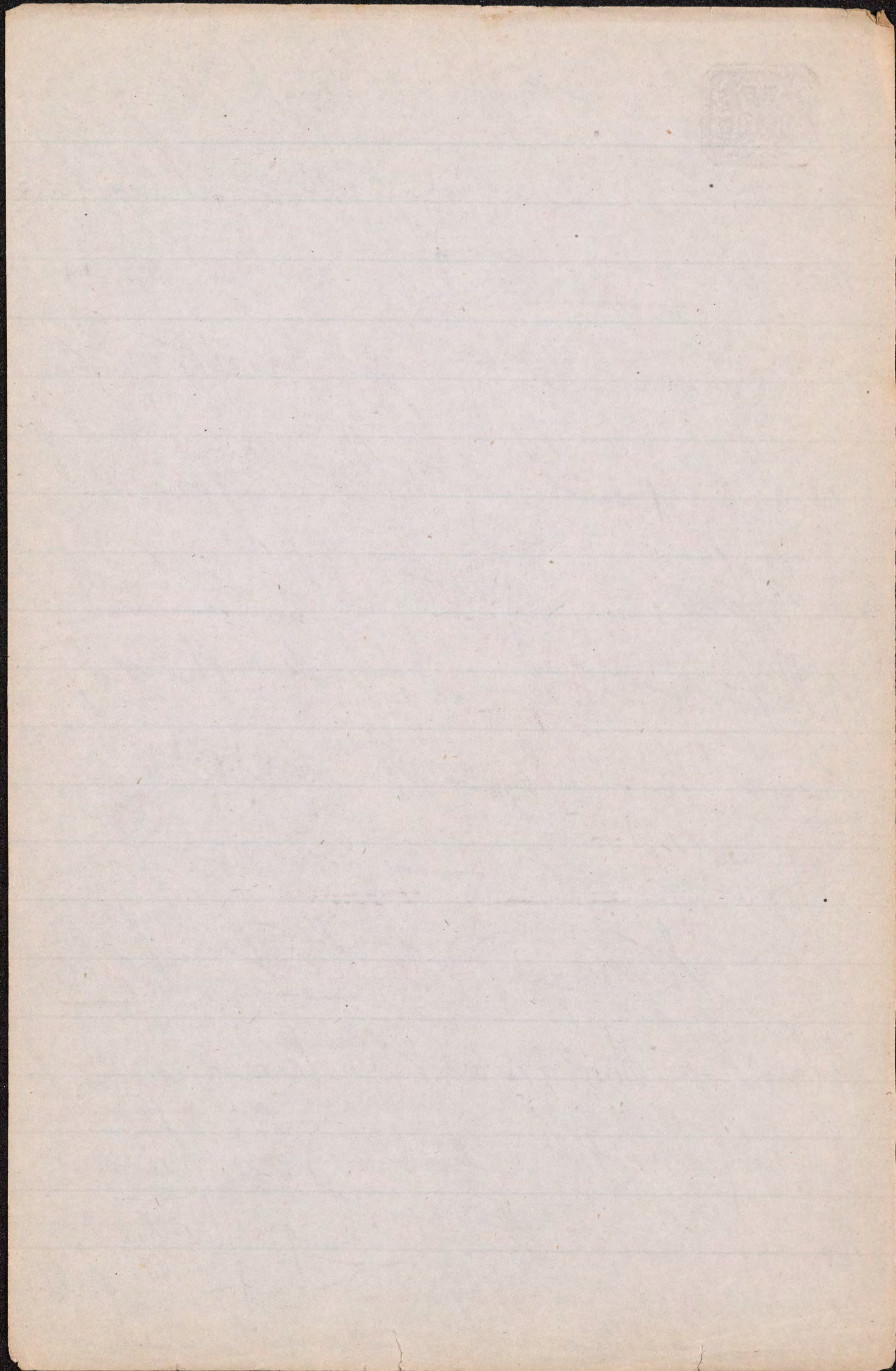
Cholera - & ground-water.

of water over & through it —
passage of air through
soil &

formation of Just : in
all which soils differ much.

Also, — ~~the~~ the chemical action
of the soil, — affects the air
over the soil, or the water running
through it. —

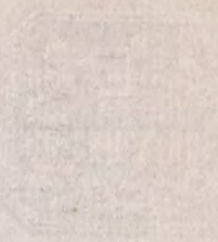
As regards to heat, sand
absorbs the most; twice as much
by experiment (Schiller) as humus
or arable earth. Clay absorbs 20
per ct. more than humus — nearly — but fully
30 per ct. less than sand —



Herbage lessens the absorbing
power of soil for heat — while
it makes radiation more rapid.
Sand radiates very slowly.

Reflection of light depends
^{mainly} on color — glare from white
rock or sand, — or a river or
lake very near — is unpleasant
to the eyes — In the tropics or
even with our summer sun, this
is important. Trees may prevent it.

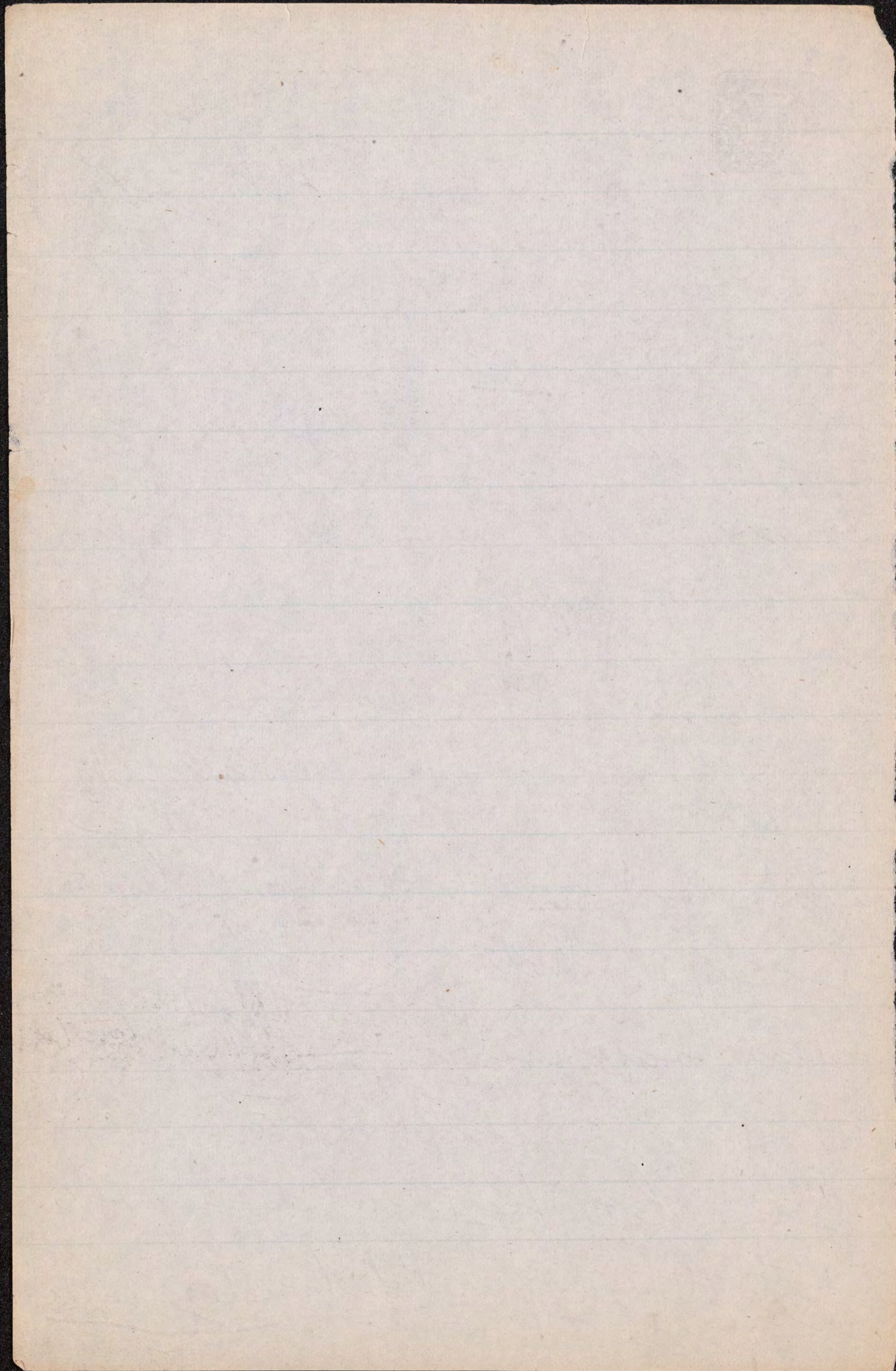
As to water — sand
absorbs very little; clay 10 or 20
times more — humus 50 or 50 times
as much as sand.



very absorptive soils pro-
-mote dampness — & this, ^{rather}
cause of malaria exist, —
intensifies it. —

through them, To the movement of water,
some soils are much more permeable
than others.

Almost impermeable, are
Granite & trap rocks, clay
slates — hard sandstones & limestones,
& clays. Water runs off of all
these except the clays — ~~then~~ which
it lodges — chiefly because the
clays lie flat, while the rocks
general slope. Refer to Geology, course.



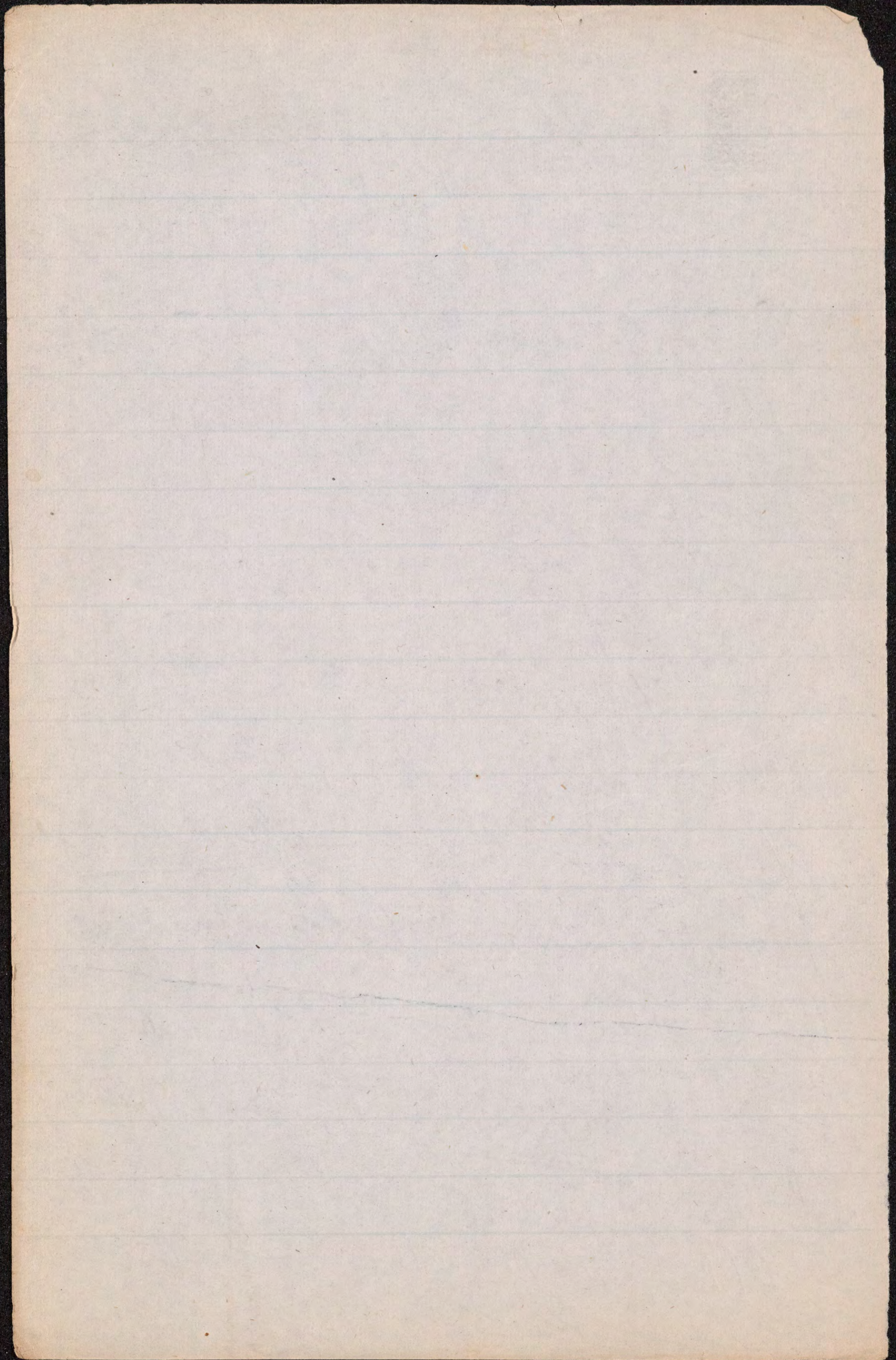
Permeable, are soft sandstones,
loose sand & chalk (not nearly).

80 to 96 per ct. ^{rain} water penetrates
sand; only 5 to 10 per ct. the
granitic rocks.

very porous soils are
built, as they drain rapidly, -
unless clay or hard rock lies
a few feet down, - holding
the water. Boring holes will be

lost thus. Such underclay formations are
quite common; for example, near the New Jersey Atlantic shore.

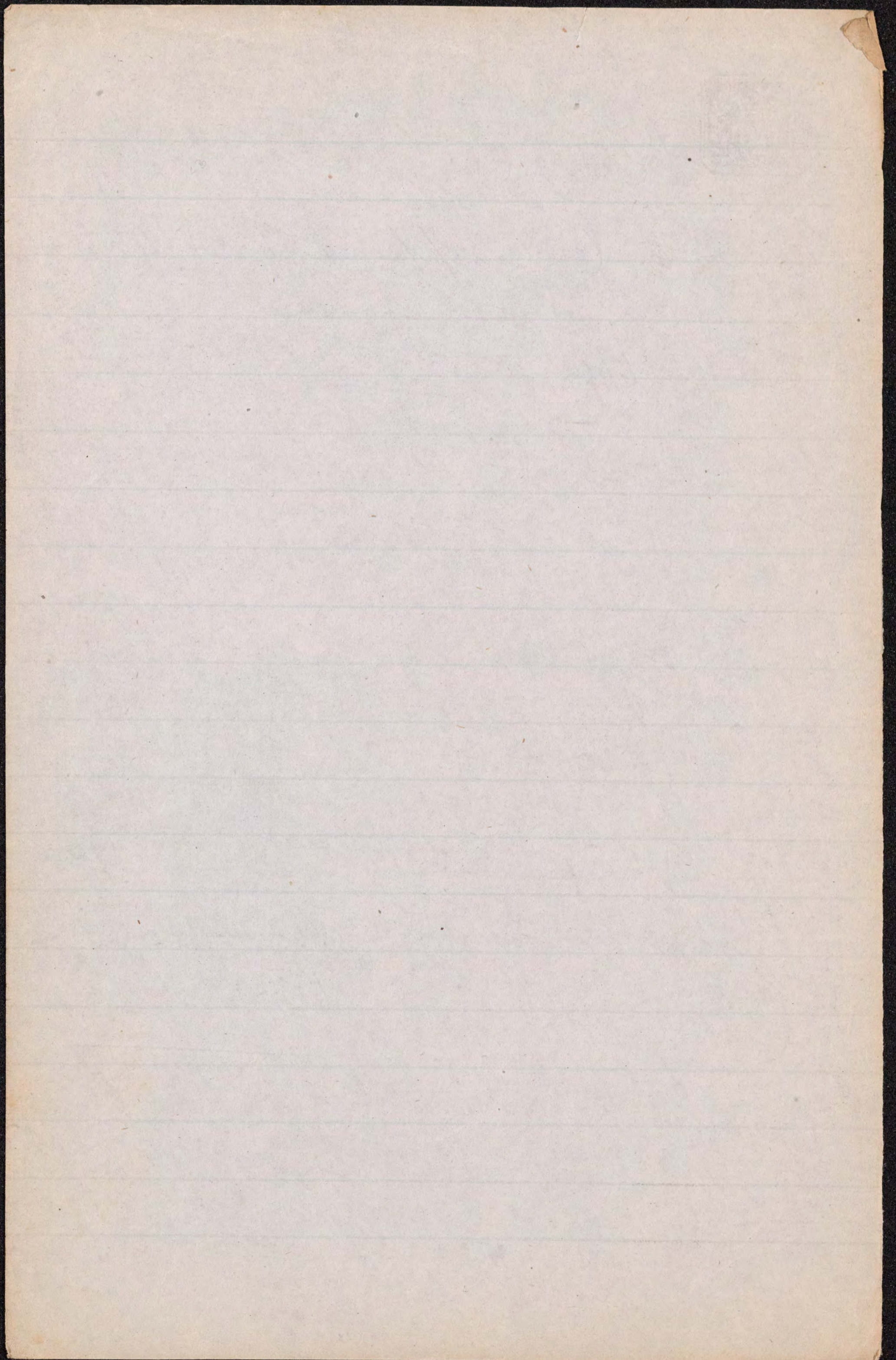
Dryness is the thing needed,
whether the ^{soil} porous or impermeable.
Of course rain there will be
known. - Just if very copious is bad for the
eyes - kinds for lungs.



Chem. composition of
the soil affects the
Drinking water as well
as air —

Some soils give off
Carb. hydrogen, carb. acid —
Sulphhydrogen — Marshes,
& new upturned soils, — organic
matter; — sometimes Malarious —

We cannot say what kind
of soil is most likely to be the
latter — many kinds, almost
all kinds have proved so.



Soils with latest
organic emanations are
(Parks)

1. Alluvial soils—

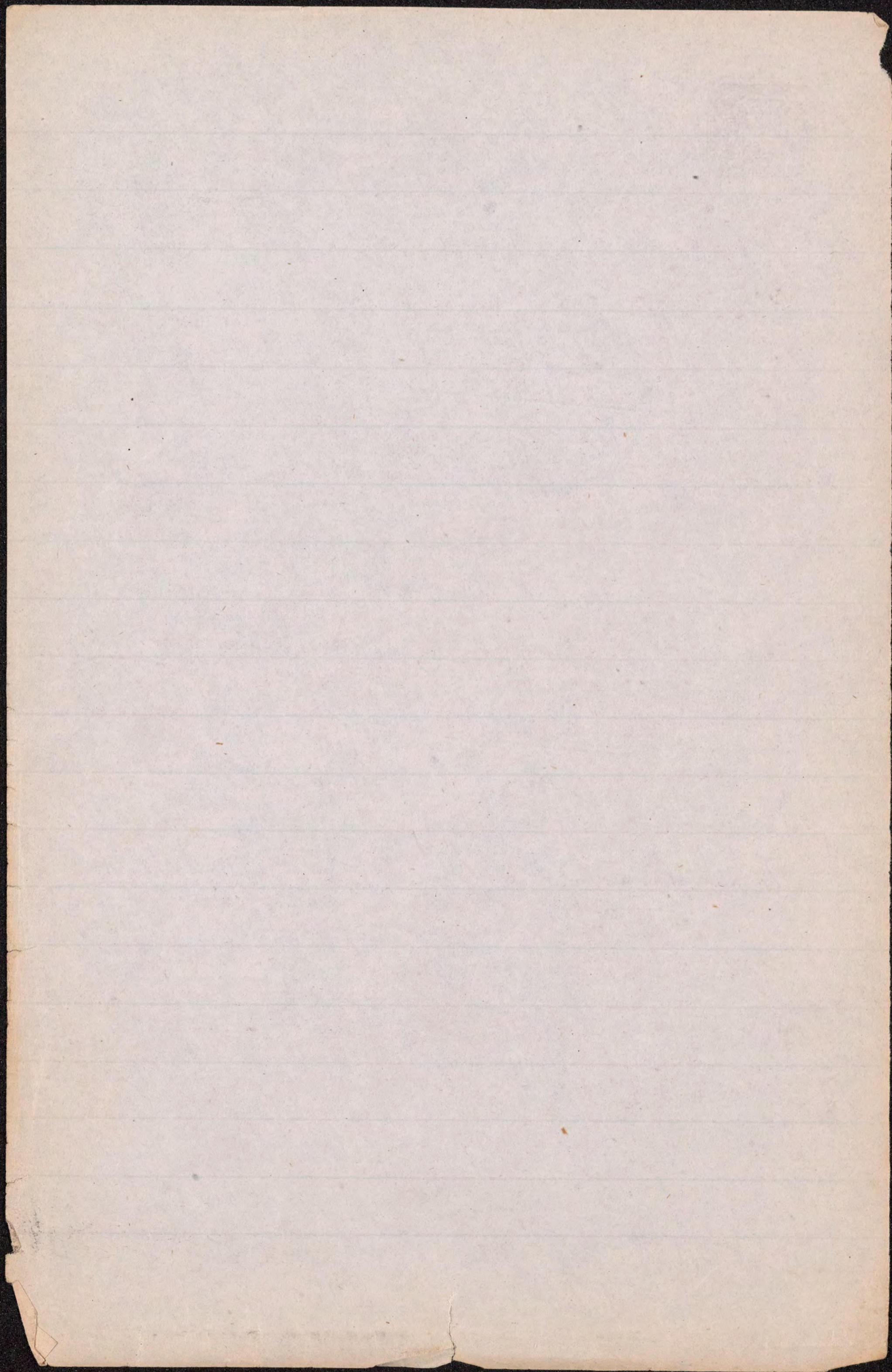
Not peat bog—

nor, so much, marshes
which sea overflows regularly;
occasional mist, salt water
makes noise—

2. Sand with clay or mud under

3. Old water courses.

4. ~~Some~~ Some rocks with whose decompo-
sition vegetable matter has become
intermixed.



Sites on Granite &
Trap rocks are general

salubrious; so, ^{also} Clay slate;

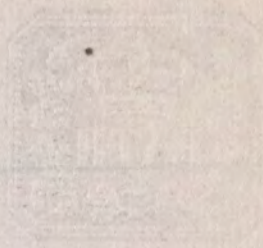
limestone ~~Magnesian~~ ^{is} often so,

but not always; marshes are
^{rather} common on them. Prefer limestone

to Magnesian formations.

Chalk makes healthy
soil. The South have it in
this county ^{except very far west.} however.

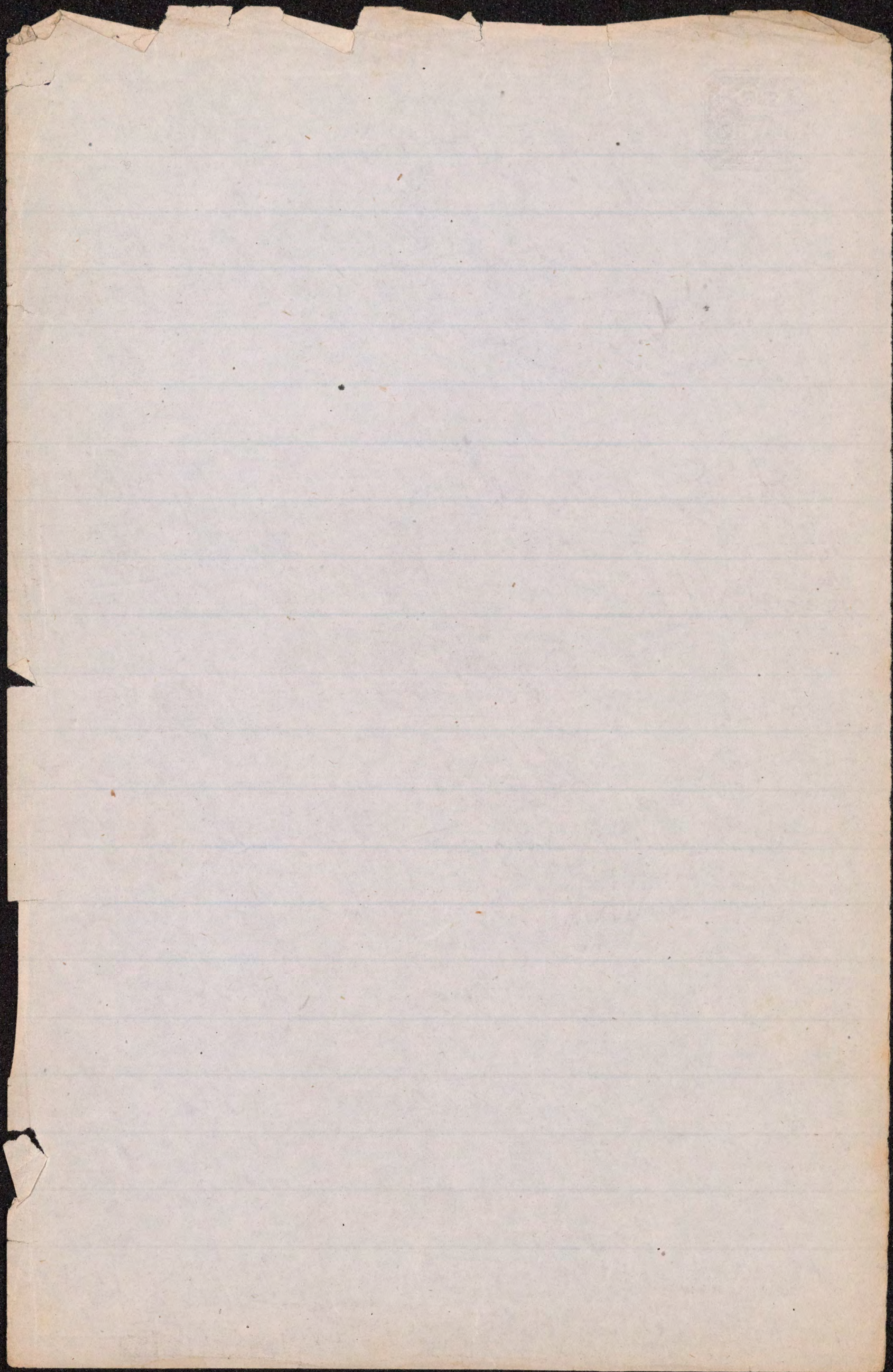
Sandstones & Gravel
are good for ^{building} sites, hygienically speaking.
Sands, sometimes healthy, sometimes reverse.



Clay, marl, alluvial
soils are always fruitful
for building sites.

Cultivation rather improves
healthfulness of soils —
but irrigation, except in
the dry climate of Egypt or
unless ^{very} carefully regulated & moderate in amount, —
is often ~~very~~ insalubrious. In
China it is extensive practice —

In S. C. Georgia rice fields
are dreadful malarious; they
are systematically irrigated, —
in north half they irrigate for rice — but only 548
miles from any city —



Herbage about the site
of a habitation is always salu-
-brious.

Thick Brushwood is objectionable,
interfering with the growth of herbage beneath it, and favoring
its decay. Trees ^{are} advantageous, if

not too many or too near

In England shade trees
are not valued as here. Our
hot sun, & ^{our} wind too,

require it; but it may be
excessive & dampening,

A grove may fend off malaria,
from a house, camp or barracks.

[End of 5th Lecture
1872]



Many remarkable and sudden outbreaks of disease, and cases of sudden death, have occurred during the past few years in houses in the city of New York, where every sanitary circumstance seemed favorable. The favorite child of a wealthy family has been suddenly carried off by diphtheria, where the house was on a hill with every drainage apparently excellent, and the rooms never crowded or over-heated. Another, living in the most airy and elevated portion of the city, has suddenly been seized with that most mysterious and terrible of the "foul-air diseases," spinal meningitis, and, under every care and precaution which wealth could supply, has died in great agony. Here a family, living in what might be called a palatial house, has been attacked with typhoid, and the children or other members have struggled for months with death. Virulent fevers have sometimes broken out in the finest houses, and some of the handsomest quarters of the city have not been exempt from pestilential diseases. Malaria has been everywhere, and Fifth avenue has felt it as well as the streets made over old water-pools. It should be remembered, too, in a sanitary point of view, that the best parts of New York ought to be utterly exempt from these foul-air diseases. There is nothing "providential," in the sense of mystery, in these sudden deaths of the children of the rich. They are as much the effect of law as would be the drowning of those same children, if they had been put under water. Modern science can as certainly reduce the death-rate from foul-air diseases as it can elevate the land, or keep down the water on the banks of a given lake. A skillful modern prison sanitary inspector has said that, if he discovered a case of small-pox or diphtheria in his wards, he should at once charge himself with defect of administration.

The best parts of a city cannot, of course, escape the diffusion of poisonous gases from the worst parts. Moreover, nuisances like our gas-works and bone-factories distribute their poisons for miles on every wind. But each house in New York has a private and individual machine for diffusing the germs of diphtheria, or the seeds of scarlet fever, sore throat, cholera infantum and typhoid. Almost every bedroom in the richest quarters of the city has a private connection with the sewer, in which are the *infecta* of typhoid patients, or the fermenting and disorganizing animal and vegetable matter, which either produce the seeds of disease, or furnish the fertile soil for these seeds to ripen in. The especial means of infection in many diseases is by sewer products. In the Croton water-bowl there is, of course, a drain-pipe connected with the main drain of the house. Ordinarily the water-traps keep the gases back. But some night, when the sleeper is most unprotected against such influences, and the vital energy is at the lowest, a flood from the sea or rain fills the main sewers, or a strong wind blows through them. The gases are forced violently back. The water in the trap-bend forms no obstacle. They rush up through the chamber water-pipes and diffuse themselves through the apartment. Had we a supernatural power of sight, we should undoubtedly see on such a night a cloud of microscopic sporules of scarlet fever, or currents of diphtheria germs, or showers of typhoid seeds scattering themselves through the house and entering the systems of the unhappy sleepers. Such as are vigorous would throw them off, but with the weak and the young the seeds would take root, spring up and bear fatal fruit. The next day there would be a "providential" case of malignant fever in the house, and in a few weeks a life would be extinguished whose loss many coming years could not cause to be forgotten.

The only prevention against such escapes of gases is to banish all water-drains from the bed-room, and to put escape ventilation-pipes on the traps. We must return to the old bowl and pitcher. The pipes should all end in the bath-room; all water be drawn from there, and this room be ventilated so as to permit no contamination of the house. The little extra trouble would be well repaid by the safeguard to life. Such arrangement excludes all chamber bath-rooms. But safety is the first thing, convenience afterward.

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Twelfth and Chestnut Streets.

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MESS MACKEREL
IN KITS.

ALBERT C. ROBERTS

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" Extra Dry,

CHAMPAGNES.

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NEW AND FINE STOCK.

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ALL THE

ALL THE ROGERS' GROUPS.

New Styles Picture Frames.

Regilding and Alterations of Mirrors, Picture
Frames, &c.

EARLES' GALLERIES

816 CHESTNUT STREET.

CARRIAGES.

CENTENNIAL DRIVING.

During the approaching Exposition season
we will most probably be hurried in

THROAT-ROT IN CONGRESS.

The Origin of the Alarming Malady That is Frightening Washington.

A Washington letter says:—Throat-rot is what some of our learned doctors call the disease that so afflicts Congressmen just at this time. We have had fourteen of them, Fernando Wood and Sunset Cox included, down with this malignant disease within a week. And it was not at all comforting to be told by the Washington press that two of these Congressmen came very near dying. And then there was a touch of true innocence that flavored of Boss Shepherd in the theory set forth by these lively Washington newspapers that all this throat-rot among Congressmen was caused by the presence of the uncleanly negroes who daily infest the galleries of the House of Representatives.

We must look beyond Sambo and with our costly sewers for the cause of all this dangerous wickedness. These malignant throat diseases, with pneumonia, diphtheria, and what closely resembles a very bad type of ship fever, Washington has been seriously afflicted with for several weeks. They are not confined to the Capitol and Congressmen, but prevail to an alarming extent all over the city. Many who were not in the Capitol this winter have been victims to it; some of them have died.

About two months ago a well-known engineer of this city, who has made the subject of drainage a study, told your correspondent that two of the main sewers were choked, and that unless soon relieved the atmosphere of the city would be filled with sewer gas, and the people poisoned to death. That is what is the matter now. He also said that the mouth of the sewer which drains the Capitol was submerged, and that he had called the attention of the architect of the Capitol to it, and that the latter had promised to have an excavation made. By all means let there be a thorough examination, and if it be sewer gas that is giving our Congressmen the throat-rot, let the blame be fixed where it belongs. It is hard enough for Hallett Kilbourne and his gang of Washington sharpers to rob Sambo of the little money he had laid away in the Freedman's Bank; it is absolutely mean to charge him with poisoning a dozen or more Congressmen.

Porch Cha in great va-
ety, desi ned especially for
ummer use.

3 21 tuth2t

9/28/1
arriving 9/28/1

CARD.

PUBLIC SALE.—I will hold a public sale of
finest quality of FURNITURE, at the second
warerooms of M. THOMAS & SONS, Nos.
and 141 S. FOURTH Street, on

Wednesday, March 29,

AT 11 O'CLOCK A. M.

there being but little demand at private sale for

GOOD FURNITURE,

and compelled to make a public sale to relieve
crowded warerooms. Goods warranted in every
respect for make and materials.

GEORGE J. HENKELS,
WELFTH, below WALNUT Street.

Three hundred Patent SOFA BEDS for sale at
STORE, at prices ranging from \$35.00 to \$65.00.
17t **GEORGE J. HENKELS.**

BLACK GOODS.

PERKINS & CO.

WE RECEIVED AND ARE RECEIVING
NEW STYLES OF SPRING

After various discussions in regard to matters of more or less interest, Dr. A. Nelson Bell, of Brooklyn, New York, read an excellent address upon The Waste of Life, having an especial reference to New York and Brooklyn. In regard to that most diabolical of all the fruits of modern society, the New York tenement-house, Dr. Bell said,—

“The raid of the sanitary police in New York last year, in view of the expected cholera, discovered thousands of people actually living in holes in the ground, a dozen or more in a huddle, in holes nine or ten feet square, swarming with vermin, and rotten with disease—no less than twenty thousand of these *troglodytes* living like moles and bats in the dark, poisoning the atmosphere around and sucking the life-blood of the people. In the tenement-houses of New York there are many single rooms occupied by from ten to fifteen persons of both sexes, and frequently by several families. There are structures from four to six stories high, divided into hundreds of rooms, crowded with men, women, and children, smothering for the want of fresh air, and in dirt and foul odors horrible to contemplate. And there are, not uncommonly, near to such buildings as these, adding to the stifling condition, yards which, with the gutters, are the common filth receptacles for the out-throwings and are the wallowing-places of the children; the streets, as filthy as the gutters, for the young girls, and rum-holes at every corner for the parents. And these tenement-houses are the homes of more than half of the children of New York. In them is carried on the perennial ‘slaughter of the innocents’ of more than two years old and under, in comparison with which the crime of Herod sinks into insignificance.

“Such surroundings obtund and destroy human sensibilities. The occupants of such dwelling-places become an easy prey to the sensual excitements of alcohol and other debasing agencies and influences. As people become accustomed to dirt, they cease to recognize its presence and to exert themselves to avoid it; there is no limit to the downward tendency. The same broad road to disease and death is the highway to moral degradation; and that such an institution should breed disease and death, that it should be the hecatomb of children, that it should sustain liquor-stalls by the thousand, and supply the ghastly gayety which flaunts beneath the gaslight and makes night hideous, that it should send the boys who escape the slaughter to State Prison—that the tenement-house should do all these things, and more than words can utter, is perfectly consistent with its appointments. And yet, to repeat, more than half of the children of New York are born in tenement-houses; but New York is called a Christian city.”

We make the following extract also from this address:

“The total number of deaths in Brooklyn last year was 10,968, and not less than one-fourth of them were accelerated by defective drainage. And yet Brooklyn is no exception in this regard. On the contrary, the death-rate of Brooklyn compares favorably with other of our large cities, which is abundantly shown by the following examples: The total annual death-rate of Brooklyn from consumption last year was 3.47 per 1000 of population (census of 1870), and on the whole number of deaths the percentage for consumption was 12.55. In the city of New York, on an estimated population at the present of 1,000,000, there are of deaths from consumption 4.13 per 1000, and 14.22 per cent. of the total mortality. Boston, 3.96 per 1000 of population,

13.84 per cent. of total mortality; Philadelphia, 3.05 per 1000 of population, 13.65 per cent. of total mortality; San Francisco, 2.74 per 1000 of population, 14.12 per cent. of total mortality; Albany, 3.43 per 1000 of population, 15.50 per cent. of total mortality; New Orleans (where the benefits of a mild climate opposed to consumption are condoned by defective drainage), 3.96 per 1000 of population, 13.84 per cent. of total mortality. By States: of the total mortality in the United States, 12.45 per cent. was caused by consumption; in New York, 16.17 per cent.; District of Columbia, 21.19 per cent. A concise table of the ratio of the deaths from consumption in every State in the Union may be found in the ‘Dictionary of Elevations and Climatic Register,’ by Dr. J. M. Toner. Under approximate temperature, the ratio of mortality from consumption in regard to defective drainage will be found scarcely less deviating than miasmatic fevers.”

sion to produce a normal condition, then there is retention,—*fixation*. Too much extension is abnormal, produces irritation, and is often the cause of non-union.

Extension and counter-extension should be applied the instant of seeing the patient, and then—*fixation*. There are no circumstances when something cannot be found to effect this. Machinery is the curse of the profession, and there is scarcely a country doctor who has not in his office a lot of worthless and expensive machines called "surgical appliances."

In setting a limb, the assistant who holds it in position while the surgeon is applying the bandages is in the most responsible position. If there is a single continuous piece of skin (no matter how crooked or narrow) for a guide, then the limb can be put in position, be held by an assistant, and properly attended to.

The speaker said that in thigh-fractures he used the

slowly past each other. He insisted that extension and counter-extension would not prevent this, in addition to the cicatricial contractions. He concluded by saying, "I again assert that the man who believes he has done it is simply mistaken. I think Dr. Sayre himself believes what he has said."

Dr. Lockford, of Missouri, wished to correct Dr. Sayre in a matter of fact. The system of treating fractures by flexion was inaugurated about the middle of the last century, and was once very popular. He then discussed the theoretical and practical difficulties of the question, and concluded by saying that he believed with Dr. Sayre that perfect cures can be effected, and that the profession should strive for perfection.

Dr. King, of Philadelphia, at the request of Dr. Sayre took the floor, and stated that he fractured his thigh over a year ago, and that now there was no apparent and only a very slight actual shortening of the limb.

The discussion was continued some time longer, after which Dr. King moved that Dr. Sayre's paper be referred to the Committee on Publication.

Dr. Quimby, of Jersey City, moved to substitute for Dr. King's motion the following preamble and resolution:

"Whereas, There seems to be some uncertainty in the minds of the profession in reference to their treatment of fractures of the long bones, therefore,

"Resolved, That it is the opinion of this section that it is nearly impossible to treat fractures without shortening."

The substitute was lost, and the paper referred to the Committee on Publication.

The Section of *Public Hygiene* had various papers before them, mostly not of sufficient interest to render necessary their reproduction here.

THIRD DAY.

The Association met punctually at 9.30 A.M.

After some business not of general interest, the report of the Committee upon the President's Address was received. *Inter alia* it urged the perfecting of the State and County organizations everywhere, an extension of the time of sitting of the Association from three days to four, and offered the following resolutions:

"Resolved, That in view of the lack of time in which to properly transact the business of the Association, an extension of one day is deemed advisable:

"Resolved, That the President appoint a committee of five, of which he shall be chairman, to elaborate a plan for the organization of an International Medical Congress, and report at the next meeting."

Suitable resolutions in regard to the death of the late Dr. Henry Miller were read and adopted.

Drs. S. D. Gross, of Philadelphia, J. M. Keller, of Louisville, and E. S. Gaillard, of Kentucky, were appointed a committee to prepare a memorial.

An appeal from the Boyle County Medical Society, of Kentucky, was read by Dr. Keller, and the following preamble and resolutions, after discussion, were adopted:

"Whereas, A most laudable effort has recently originated in the Boyle County Medical Society, of the State of Kentucky, and in the Kentucky State Medical Society, to create a fund for the erecting of a statue or some other suitable memorial in honor of Dr. Ephraim McDowell, 'the father of ovariectomy,' English writers to the contrary notwithstanding, who lived in the town of Danville, in the State of Kentucky, and who per-

Best drainage
& best and most

Tents

Huts

&

Barracks.

* The principles of Hygiene applicable
to Military ^{camps} ~~encampments~~ are
equally available for all
other ^{encampments,} — as of exploring expeditions,
^{parties,} emigrants, &c. And therefore
we may ^{properly} give some ~~proper~~ consideration
to them here, however few of us may
^{ever} have occasion to put them to immediate
application. o

medical officer of the army is the supervision of the hygiene of the post or command to which he is attached and the recommendation of such measures as he may deem necessary to prevent or diminish disease among the troops." The order then specifically defines his duties, which require he shall at least once a month examine and note in the medical history of the post the sanitary condition of the quarters, including all buildings belonging to the post, the character and cooking of the rations, the amount and quality of the water supply, the drainage and the clothing and habits of the men, and make a report thereon in writing to the commanding officer with such recommendations as he may deem proper. 

use of general readers and the promotion of social science and hygiene.

The second volume of Public Health Papers should now follow closely upon the first volume (of 1873—now in binders' hands,) for the second year's fruit is a natural and bountiful outcome of the first as well as the second year's labor.

For the general status and field of the association, attention is invited to the opening address of the President on preceding pages.—Some of the other addresses and papers will appear in our pages hereafter. *The Perils of the School Room*, in our next.

the ensuing year.

SANITARY DUTIES OF ARMY SURGEONS—The War Department has issued a general order saying:—"An important part of the duty of a

his occupation, ward and street, where he resided—with the name of
the physician who attended him in his last illness and the cemetery

— 4481 —

0



By actual statistics of the British army, Dr Farr has shown that the mortality of soldiers even in peace is twice as great as that of civilians of the same age. This excess of deaths is greatest in the first year of service; and during campaigning in war, is greatest in those under full age. Even in war, disease is, or has been at least in many wars, as that of the Crimea, of 1854 & 5, - nearly 4 times as destructive as wounds received in battle. Fred. the Great of Prussia said that fever cost him more men in a year than seven battles.

The hygienic management of the U.S. army during the late civil war was, with the aid of the Sanitary Commission & other patriotic benevolent associations, far better than in any previous war in the world.

To temper summer heat, - (4)
Punkah, or horizontal fan,
over heads of company,
worked by natives (now,
with some Nabobs, by steam)
in India,

Tattie, mat saturated
with water, hung in
doors & window spaces,
also East Indian.

Under ground tunnel - was
made at great expense
at Palace of the Trunk,
Costosa Italy; described
by travellers in 1683. It
sent cool air to every room
thru' an opening in the tunnel.

The application of the principles of construction & ventilation
may now to advantage be illustrated by
Tents - Huts - Barracks -
~~as ~~more~~ temporary habitations~~ -

& Hospitals: ~~temporary or~~ ^{temporary or} permanent.

The ~~use~~ of all these ^{the need} ~~& of~~ has
been well arranged) ~~has been~~

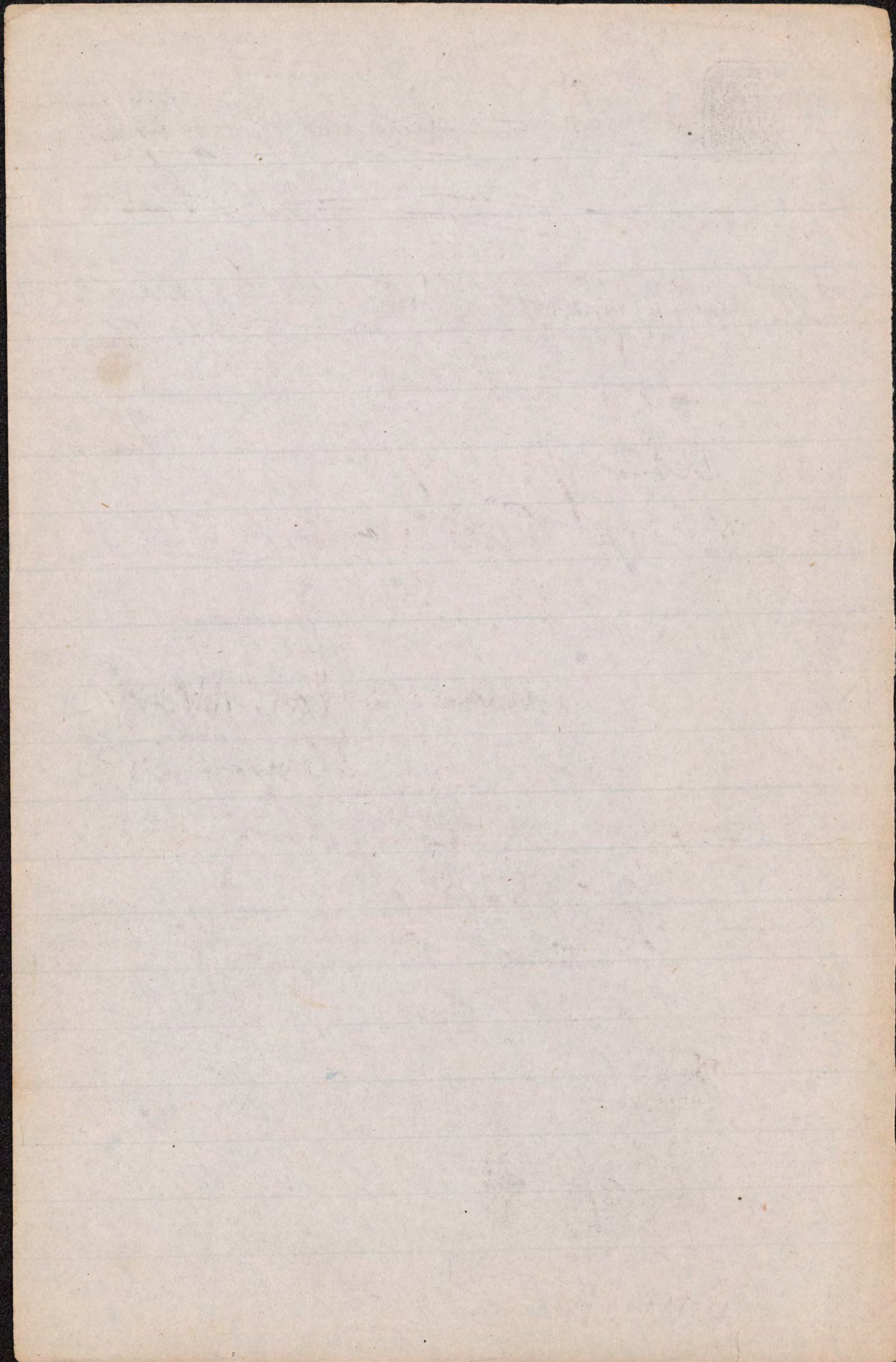
^{thoroughly} exemplified in the experience of
this country ~~in the~~ ^{during the} ~~last~~ ^{late} ~~war~~ ^{war};

~~years~~; in a way that we

may ^{of confidence} ~~firmly~~ ^{hope} may never
^{on our continent} be ~~seen~~ again -

Mil. Hygiene *

Simple as they seem, even tents,
especially if large & with a number
of men in each, may be serious if ventila-
ted; as ~~shown~~ ^{shown} by Stewart Clark, in
his ~~work~~ ^{work} on the hygiene of the army in India.



~~Clark~~ Clark speaks of the tents
there in use having often but
77 cubic feet of space for each
occupant — & never more than
220 cubic ft.; of course a great
deal too little; so that he has
to use not only openings near
the poles, ~~canvases~~ covered, but even
moveable fans or thermantidotes,
for tents — in that ^{hot} climate of India.

In the U.S.
In ~~our~~ army, the tents
used have been, — the

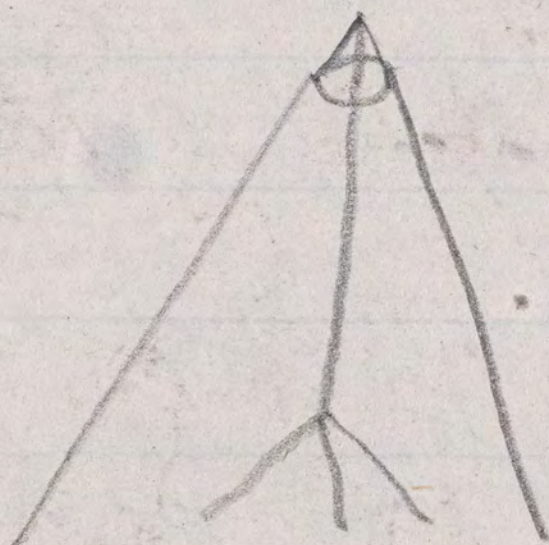
Sibley,

Bell

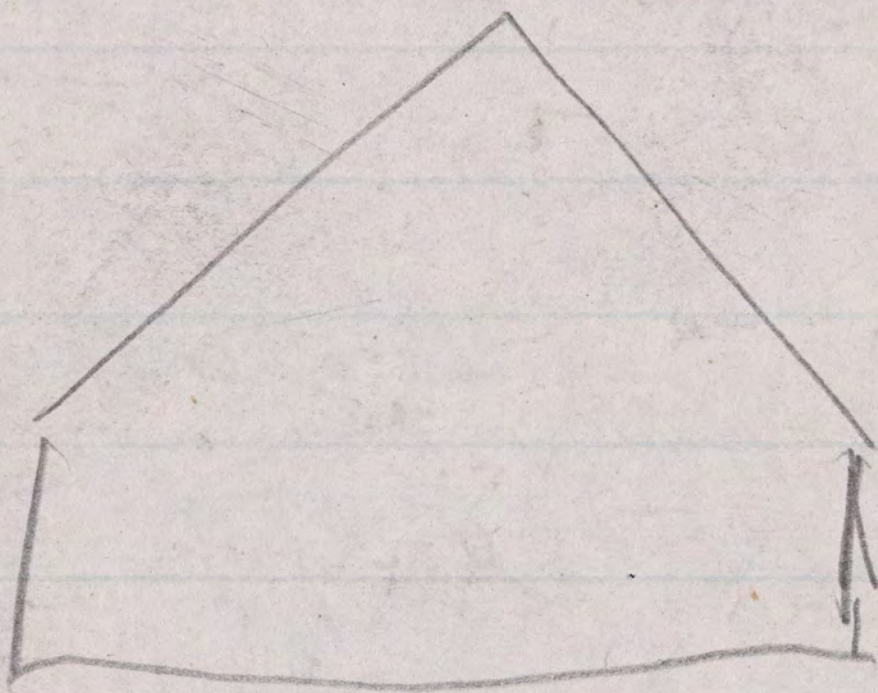
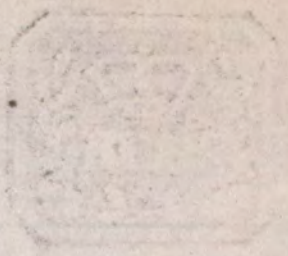
~~Officers'~~
Hospital, ~~and~~

Wedge
Shelter tents, &

Ponchos.



The Sibley tent is much
like a Comanche Indian's lodge.
It is conical, 18 ft in diameter,
13 ft high, with an opening at the
apex, ^{at the base,} covered partly by a movable conical
surrounded by an iron ring,
connected by ~~3~~ ^{central} chains to the pole.
This pole rests on 3 legs, which
are hinged; so as to be raised or
lowered. The edge of this tent
touches the ground all around.
As Dr Hammond says, in his work on
Hygiene, — the edge ought to be
raised, or capable of being raised,
so that air could pass through.
As it is made, it gives 1102 cub.
ft space — in which 20 or 22 men are
often sheltered, ^{for months} ~~weather~~



Dr. Hammond speaks favorably of the Sibley tent, even
as it is; as easily warmed & ventilated. For the latter
object, however, its ~~door must be open~~. The bell tent is not

unlike the Sibley — but instead
of the open at the top it
has a window, with a flap, near
the top on one side.

The Officer's tent is
^{round dome} square, & has ^{a wall or} ~~sidings~~ 4 ft.
high, which can be raised all
around. It has also a fly,
to keep off sun & rain.

The hospital tent is
of heavier canvas, — is 15 ft
square, with a wall 4 ft high
^{is in all} 12 feet high to the ridge. It
has a fly, — is open at both
ends. Several can be arranged end
to end.



Each hospital tent will
hold comfortably 6 men, on
beds, with passages between.

Dr Hammond ^{asserts} ~~says~~ that
"in a hygienic point of view,
tent hospitals are the
very best of all — in warm
weather should be preferred for
all classes of patients."
Even in winter they can be warmed
very well with stoves.

In summer at least, I believe
that abundance of ~~other~~ testimony
can be brought in favor of tents
for hospital use instead of large close
buildings. Hospital gangrene is not
met with in tents; gangrene I mean which is

not dependent on merely individual causes.

★
^ Experience in regard to the health of
the men during the ^{early part of the} war led to an increased
use of the shelter tents instead of the others.
This change began to be carried out in the summer
of 1862. End of 7th Lecture, 1872

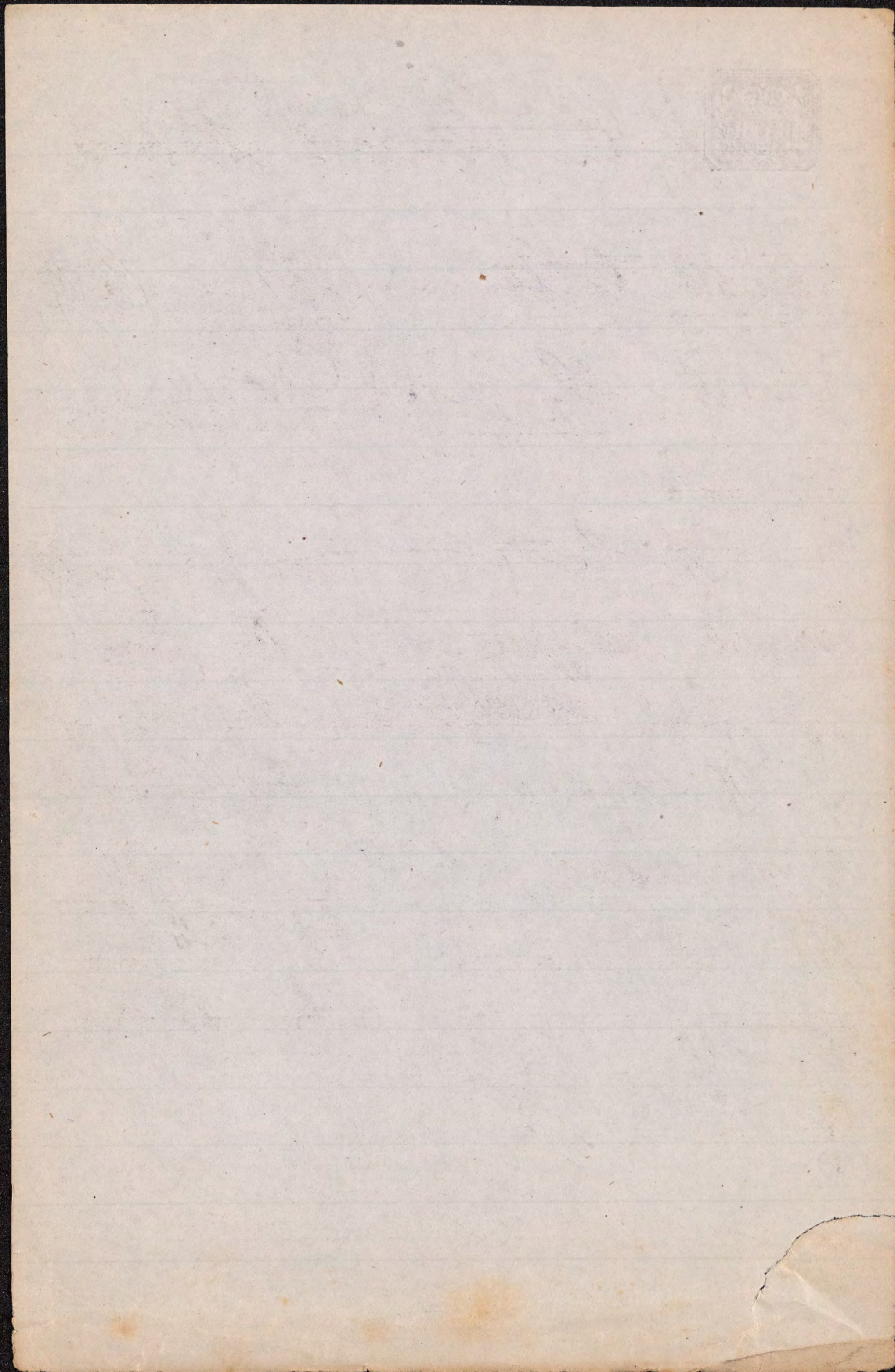
The flooring of a tent should never
be the bare ground. ^{as pine lumber, cut for the purpose,} Branches of trees are
often the best or only cover for the ground;
they ought ~~not~~ to be used, to keep off damp-
ness; which ^{subject} is indispensable. Thick canvas or
India-rubber cloth ought to be provided
also, for every man to lie on; and ~~they~~
should be enjoined to keep ^{themselves} their blankets
~~in a camp~~ dry. ~~Dry blankets are as important as dry~~
~~clothes can possibly be; as the man is a more~~
~~important instrument than his gun.~~

Clean ground near the tents is also important.
Therefore every twenty men, at least, should have a night-
bucket with a cover, for a urinal. ^{Each tent & its bedding & blankets ought to be well aired every day.}

The Wedge tent is
described by ass. Surg. Wood
and as being 6 ft 10 in long,
8 ft 4 in. broad, & 6 ft 10 in high;
having capacity of 194 cubic ft; 6
men often occupied one of these;
giving them very little air to breathe.

The Poncho is a square piece
of oil cloth with a slit in the
middle, thro' which the Soldier's
head may project.

The Ponchos of two Soldiers
may be put together to make
a ^{small} Shelter tent. $\times$



According to Dr. Parkes,

In the British Service

Bell tents, — Officers tents,
much like those already described (as used in this country),
& the Hospital Marquee
are used.

The latter is two-poled, with
double canvas — 33 ft long —
5 ft high straight from the ground
on all sides — & then slopes
to the ridge, which is 12 ft
from the ground. It holds
ten men — with a cubic space
of 3366 ft.

first used in Africa,

* This French shelter-tent is the original
of ours. The parts are each almost square,
(they should be 6 ft square in this country)
5 feet by 5 ft 5 in - with buttons & button-holes
(better, eyelet-holes & cords); each has with it
a stretching rope, 8 ft long, a tent-pole, 46
inches long, 3 pickets, & two picket-ropes eighteen
inches long. If six men unite these squares,
with the poles, ropes & pickets, all of them
can sleep under the double tent so made.

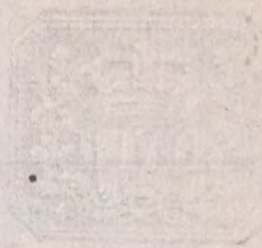
Folded double, with the tent-poles
for handles, a shelter-tent makes a good
litter for a wounded man who can sit up but
has to be carried. At full length, single,
a wounded man may be placed upon it & carried
as in a hammock.

④ Pickets are sharp-pointed stakes, to
be driven into the ground.

 In the French army
there are chiefly two kinds of tents;
One, the tente d'abri for 3 or
4 men; each man carries $\frac{1}{3}$ or
 $\frac{1}{2}$ part and a stick. The can-
vas so carried may be used for
cover in marching: ^x

also the French have a [^]
tente de troupe — a two-
poled tent, with a connecting ridge
pole.

Wooden huts have
~~been~~ been used for soldiers
in our army to some extent, & in
Europe, especially for winter quarters.



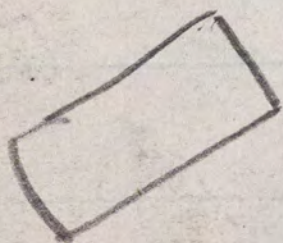
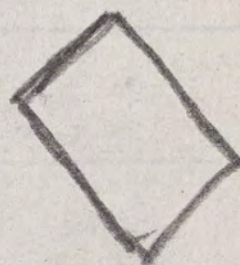
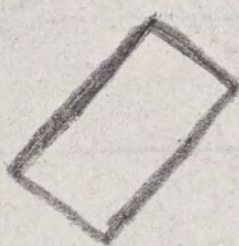
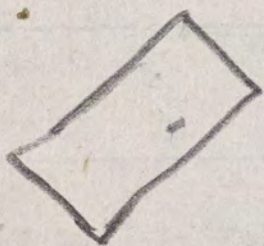
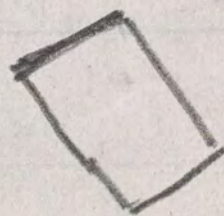
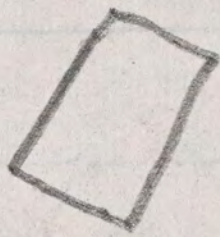
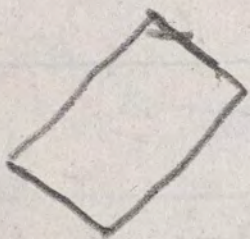
For these Dr Parkes
Directions are very good and
some of them might be applied
also to tents —

The floor should be made
without ^{digging any} excavation ^{under it,} — nor yet
^{should it} be directly on the ground, if avoi-
dable. Let it be raised;
oles and pass underneath.

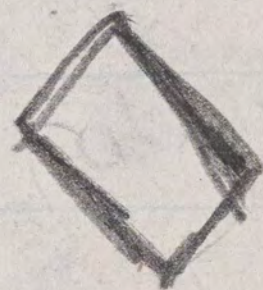
Drainage should be arranged
for, also, beneath the hut or tent.

Ridge ventilation may be
used in huts. When ^a ~~store~~ or
any kind of fireplace is required in
winter, especial care is needed
to maintain ventilation & escape ^{the}
of smoke. — Dr Hammond says each hut
may be made to hold 20 men.

1 1 1 1
1 1 1 1



Ha! Ha! Ha!



See Hammond.

Trenches for draining
of rain, should be carried a-
round ^{each} hut or tent; sometimes
the earth must be cut away
so as to descend all around it.
A source of unhealthiness to be
carefully prevented is, the collection
of uncleanly things under the floor
of a tent or hut. —

Branches of trees were sometimes
laid to make floors for tents

During the ^{late} war, ~~the~~ ^{some have been made} ~~the~~ ^{by stretching} ~~the~~ ^{blankets of the soldiers over} ~~the~~ ^{these} ~~the~~ ^{firelocks.}
In the English army, ~~the~~ ^{by stretching} ~~the~~ ^{blankets of the soldiers over} ~~the~~ ^{these} ~~the~~ ^{firelocks.}
Arrangement of tents or
huts is very important in camp

by scene. The situation, in the first place, should be,
when practicable, on moderately sloping ground; near woods,
& near a stream of good water; never near a marsh if possible
to avoid it at all. If unavoidable, choose ground
side — & build fires between
marsh & camp at night

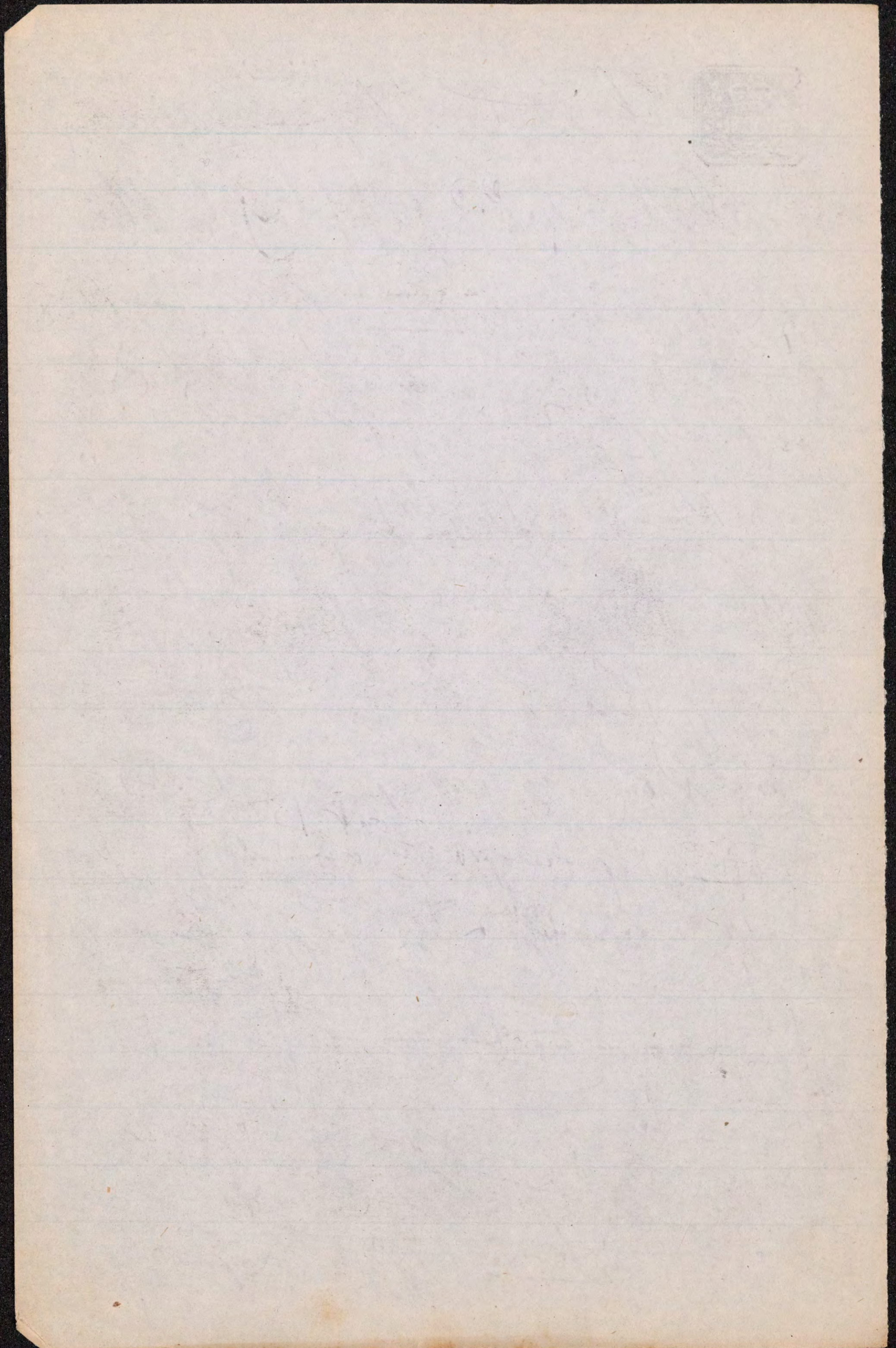
□

The statement, 1871, gave
London but 2609 to a sq. mile.
Probably included all its suburbs &
taking average of all.

Each tent, by ^{U.S.} ~~the~~ army
regulations, ~~which~~ apply to the
Wedge tents — has an ^{space} cl-
-board of 215 square yards;
over 14,000 (14,408) tents on a
square mile: each tent 6 men.

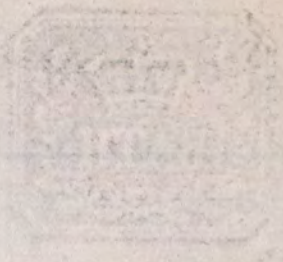
Thus a population of over 86,000
(86,448) to the square mile. The
^{sewer part of the} City of London has about 150,000 ^(Parker) to sq.
mile; Philada. ^{leaving out the entire rural suburbs,} 45,000, so that
camps are ^{always} ^{more} populous — al-
though no doubt an improvement on
former times. . .

^{i.e. privies,}
Camp latrines are
very important in ~~the~~ sanitary aspect.



They are trenches, which
should be 150 yards from the
Camp — on the side opposite
to that from which the prevailing
wind blow.

Each trench ought to be
10 ft long, 3 ft broad, & 5
deep. A forked stick is to
be driven in at each end of the
trench, & a pole laid on ^{these} it
for the man to sit upon. Every
^{or evening,} morning part of the earth thrown
up in ~~driving~~ the trench should be
put in again: when $\frac{2}{3}$ full it
should be filled quite up, & a
new one dug. Neglect of such



precautions accounts not
only for much ill health
in camps — but also for
the marked well known
mortality of old desert
encampments. Cholera has
often, ~~attacked~~ ^{attacked} a India like
where troops ~~where~~ returning
to old encamping grounds; & so it
has, camps of emigrants off and for western plains.
(are should be taken never
to put camp latrines near
a spring or running stream — as
put upon might follow the
contamination of water afterward
used for drink & cooking. —

In regard

to fever, we have other testimony also.
Dr. Ordronaux ^{of New York} in his "Hints on Health in
Armies" (a good little book) cites the instance
of the military hospital of Versailles, from
1843 to 1847; where, every year when the
King arrived ^{or should}, typhoid fever broke out,
& many cases continued to be brought from
the garrison to the hospital — the epidemic
ceasing as soon as the King went to Paris.
The cause of it was, that whereas the gar-
rison at ordinary times consisted of 4 or 500
men, — during the King's visit it was 1200;
all in the same space, probably small enough
for 500 men. Crowd poison there was, clearly
here. It should ^{interestingly if possible,} be ~~clear~~ ^{sure} that it was
typhoid, or enteric, & not typhus fever; but in
any case the lesson is a very practical one.



Of barracks for the
more permanent lodgement of
soldiers, a good deal might be
said — but I ^{must} hurry over
the subject.

I Parker remarks, that the
^{kind of} two diseases which in European
armies have caused the greatest
mortality, have been destructive
lung disease — chiefly phthisis, — &
typhoid fever. He believes both
to be much promoted by want of
good breathing air in barracks.

Even in the mild climate of the W. Indies
British soldiers die very often of consump-
tion; as they ought not to do with good hygiene.



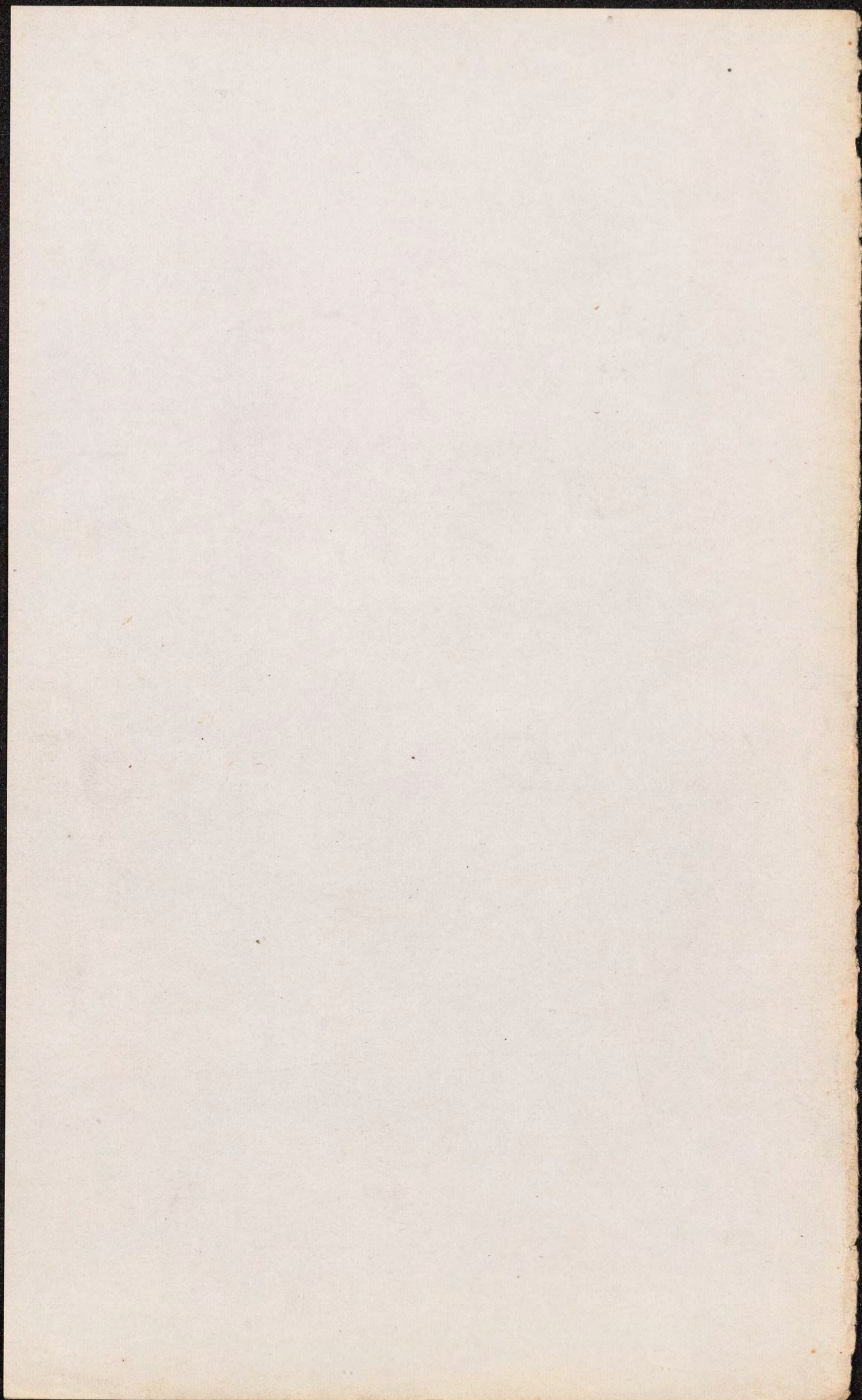
In the E. Indies, instead of
lung disease & typhoid fever,
Cholera & dysentery find a
like powerful promotive cause.

A Barrack Commission
in England has much improved
these plans,

^{Commission}
They recommend that each room
should be made for hold; 24
men: narrow rooms, with 2 rows
of beds — one window to every 2 beds;
a room 60 ft long, 12 ft high &
20 ft wide; 600 c. ft space
per man. Wash room & urinal at
the end of the room. —
One story, raised from the ground, or
2 stories at most, will be the best. —



Important improvements
were also carried out, ~~but the effect~~
of saving many lives, in the short
but terribly destructive Franco-
Prussian war. American ex-
perience was, during that war,
effectively utilized.



Hyg. of Resp. & Atmosphere.

Conditions of Healthy breath, 1. Sound l. & a. t.; 2. Muscle bronchiae;

3. Pure air; 4. Change of air.

Amt in 24 hours - 350 c.ft.

Constit. of atmosph.

Essential - O_2 - H_2O & Ozone -

Non-essential -

CO_2 SO_2 NH_3

NO_2 & Org. matter -

aerophyta & aerozoa -

"Disease germs" -

Sources of impurity of air -

Respir. - Combust. -

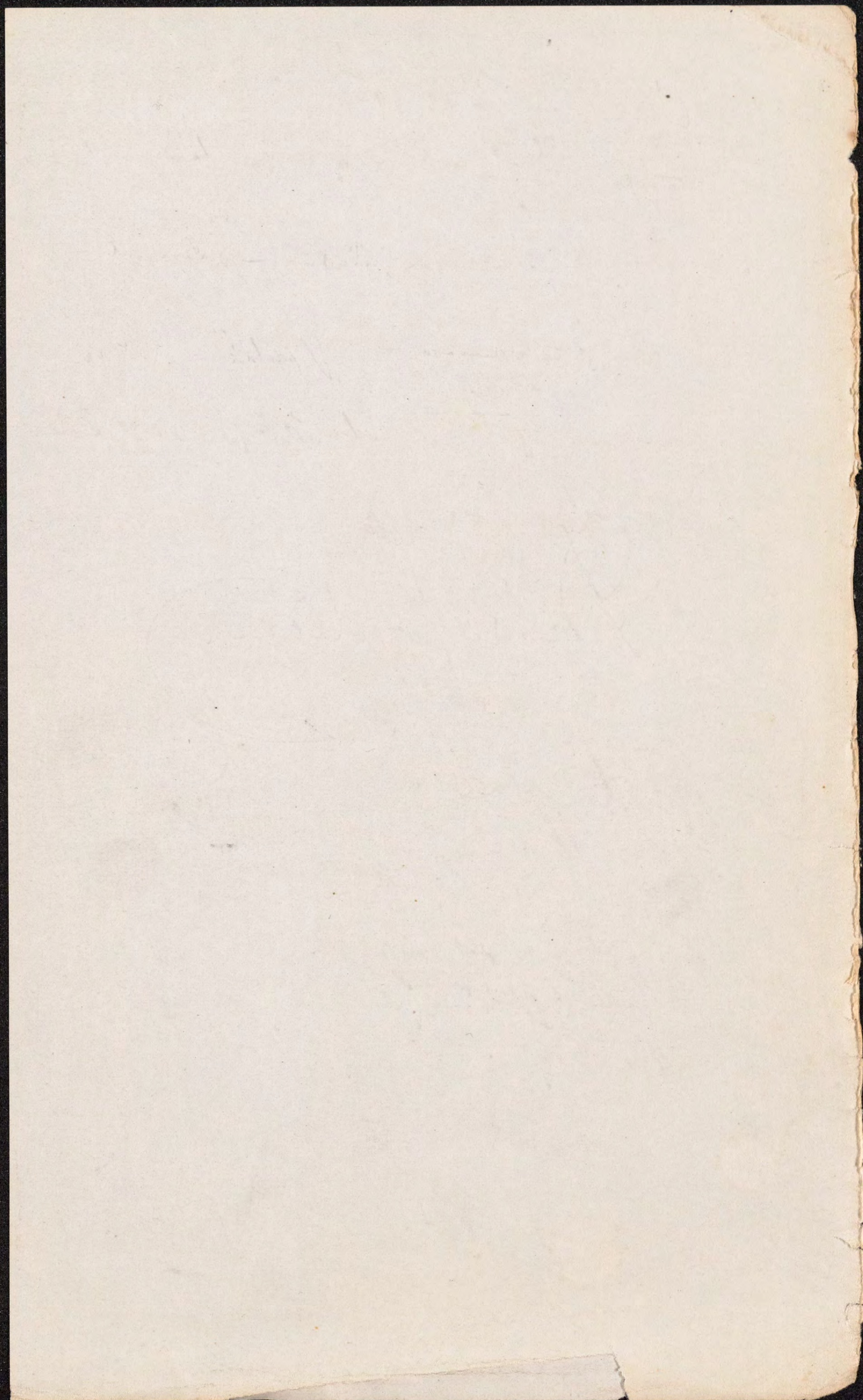
Org. decompos. - (sewage &c)

Ventilation. Diff. of gases

Inequality of temperature

Nat. & artifice ventilation

Disinfection.



SEWER-GAS.

A Perfect Ventilator and Sewer-Gas Cremator.

THIS apparatus consists of an air-tight packed chamber, which takes the place of a portion of the ordinary lining in the house-range, stove, fireplace or furnace; not interfering in the slightest degree with the draught or capacities of the heater. With this chamber, two pipes are connected; one of which joins the drain-pipe at its lowest point, and the other enters into and extends upward through the chimney. The action of this is obvious. The heat creates a draught and draws the sewer-gases into this hot chamber; in passing through which, they are completely purified and are discharged into the open air free from poison. An opening is made at the highest point of the waste-pipes of the building to supply fresh air for this draught. A constant current of air is thus created; beginning at the vent-pipe at the highest point of the waste-pipes of the house, passing downwards entirely through the waste-pipes and drain-pipe, then upward into the hot-air chamber above spoken of, (where the sewer-gas, which is carried along with it, is entirely consumed,) and then discharging into the open air, through the pipe in the chimney, completely deodorized.

This whole contrivance is remarkably simple and inexpensive; is easily attached to any kind of heating or cooking apparatus, or even to a gas-jet, and can be used to ventilate the bilge of vessels and keep the air pure in any place where foul and poisonous gases are generated. It is not necessary to have the fire burning continuously; an hour or two a day will work wonders in the purification of foul places.

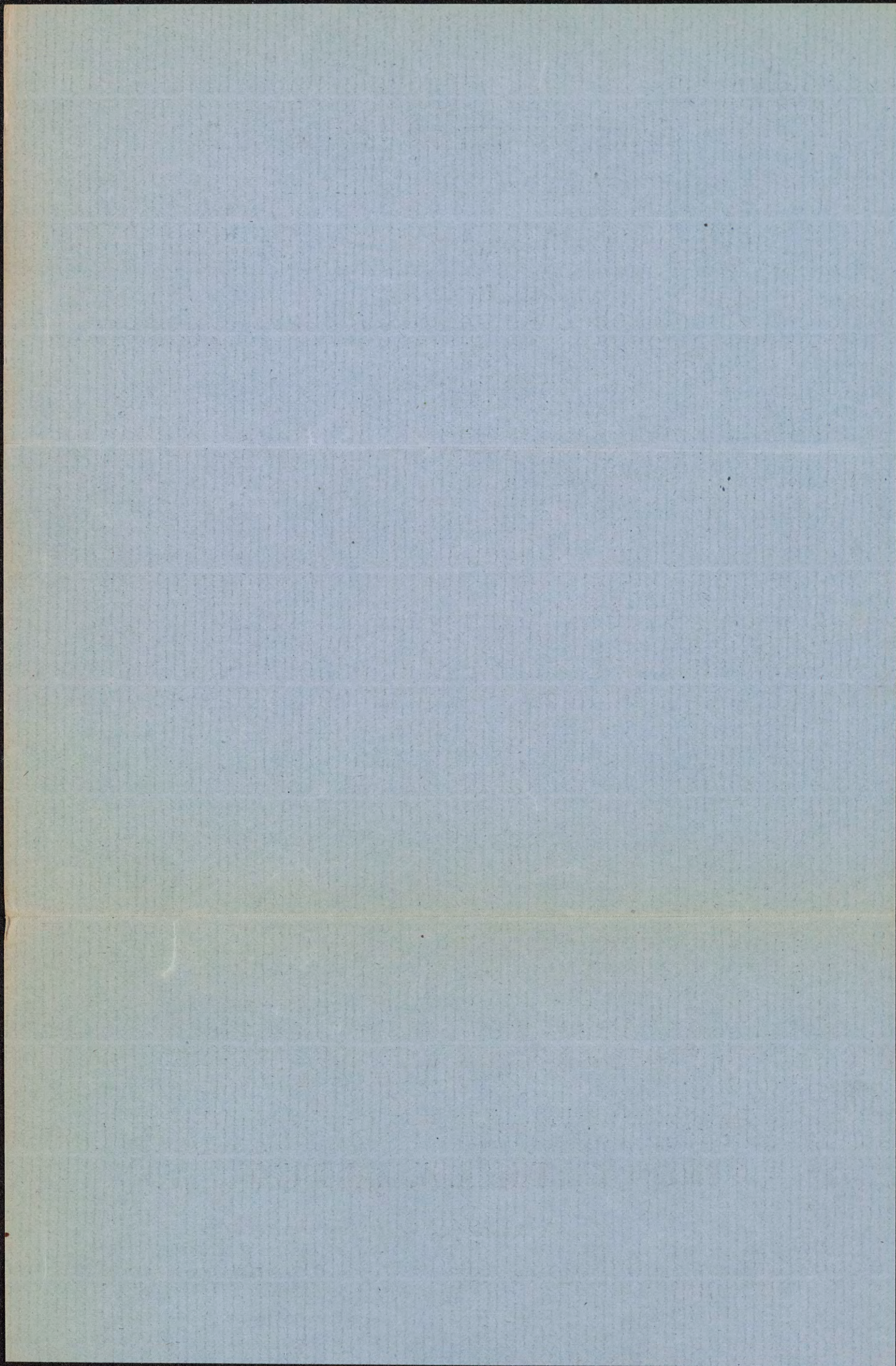
That sewer-gas will be robbed of its terrors by means of this invention is beyond a doubt. The temperature to which the gases are heated in passing through the hot-chamber will rarely be less than 400° Fahrenheit, and it has been demonstrated that the vitality of vaccine matter is destroyed at a temperature of 140°; the virus of scarlet fever at 204°; and the lower orders of vitality at 212° Fahrenheit, or, perhaps, a little higher rise of temperature.

The apparatus may be seen in successful operation at the Warehouse of

THE A. W. RAND COMPANY,

124 North Sixth Street,

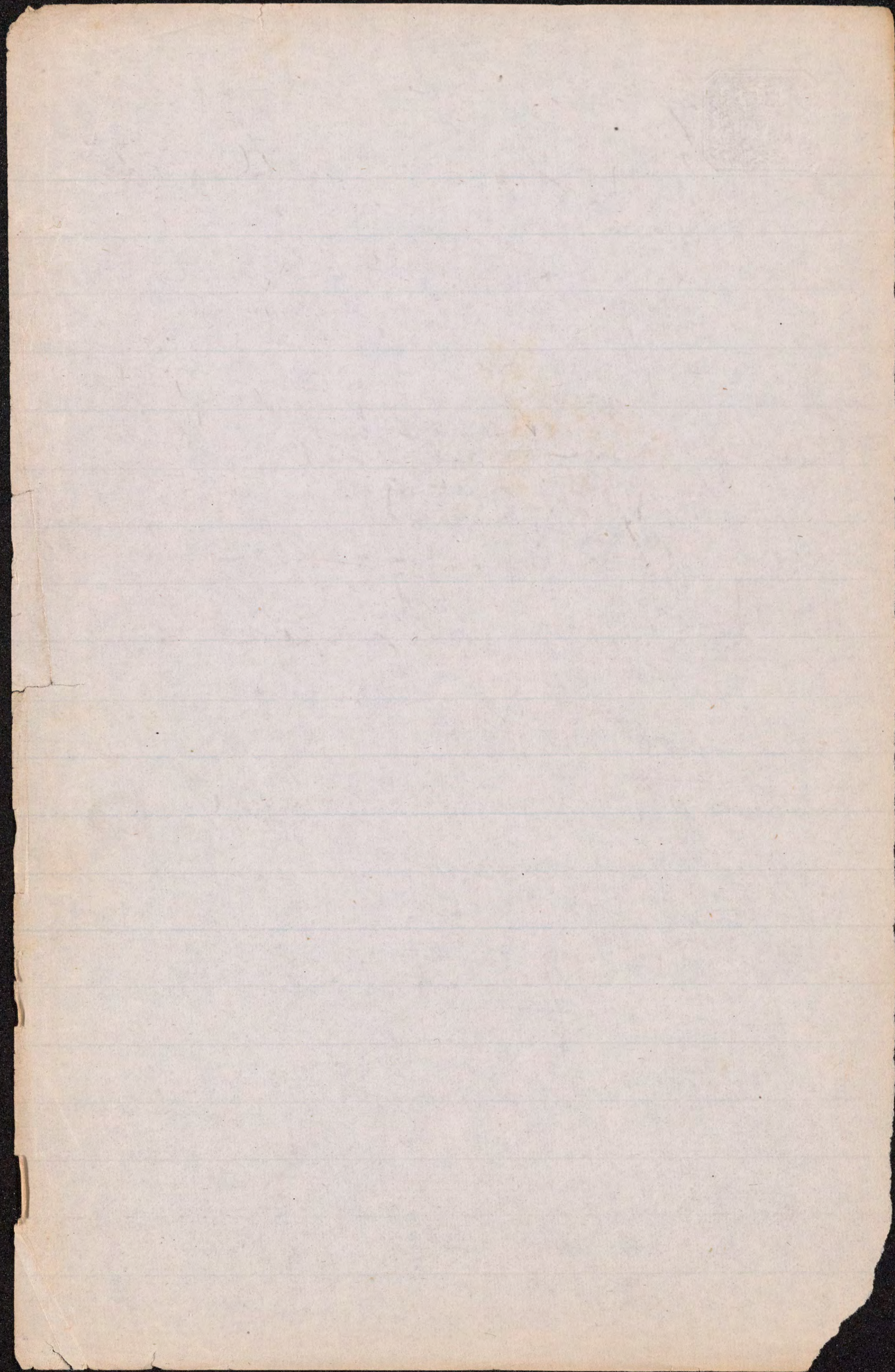
PHILADELPHIA.



Leave ^{over} for a short time
the topic of ventilation, let
us give some consideration now
to the different agents used &
useful for what is called
"disinfection". The name
is hardly an accurate one.

De-odorization of the air of a place
is quite possible; partial purifi-
cation is also; but the real
destruction of morbid zymotic poisons
is effected ^{with certainty} only by two agents
high heat & great cold.

It is therefore by custom & want of a better
name that we are induced to call many things
disinfectants. -



They have, however, a very considerable value — especially when they can prevent the production & emanation of

foul ~~gases~~ into the air.
But none of these substances will actually destroy the infectious cause. ^{It is} after fresh air in ^{the} ventilation, as a local purifier, comes water: — used abundantly & carried off — so a heavy rain acts; — but we cannot easily imitate this —

~~1. Absorbent~~

2. De-sulphur

3. Antiseptic

4. Deodorant

5. Evaporant

as Carbolic acid

as Sulph. iron &c

as Chlorine, Permanganate

as Carbolic acid

as Carbolic acid

as Carbolic acid

+

For foul breath:

Chlorate of potass ^{gr. v dose} internally - or charcoal - ^{gr. i dose}

Dysphagia - or permang. potass. - or 5 gr. dose

Liq. Sod. chlorinat. ^{gr. v dose} diluted -

As washes -

tinct. myrrh - a little in

water - other spices - as cloves or Cinnamon &c - & sol. permang. potass.

gr. i in ℞ij or much diluted Liq. Sod. chlor.

℞ij in ℞vi

Disinfection

Prevention is better.

1. Ventilation.

2. Washing the air - the water being carried off.
Washing water closets de - soap & water.

3. Dry earth - 4. Lime - 5. Charcoal

6. Earth Closets - { Whitenash -
Xover heaps -
Tar (wood or coal tar)

7. Chlorine: - Chloride of lime - Labarraque's -
(Chloride of zinc + Chloride of iron) -

8. Sulphurous (oxide) & Nitrous acids (Nitrogen peroxide)
X Lead - Nitrate (Ladys) versus H S only

9. Permang. potass - { Drinking water - 10 gr. in
a gallon (after filt. thro' charcoal
& gravel)

10. Sulph. iron (green vitriol) Chloride of Iron -

11. Iodine - 12. Bromine - (Dr. Goldsmith) -

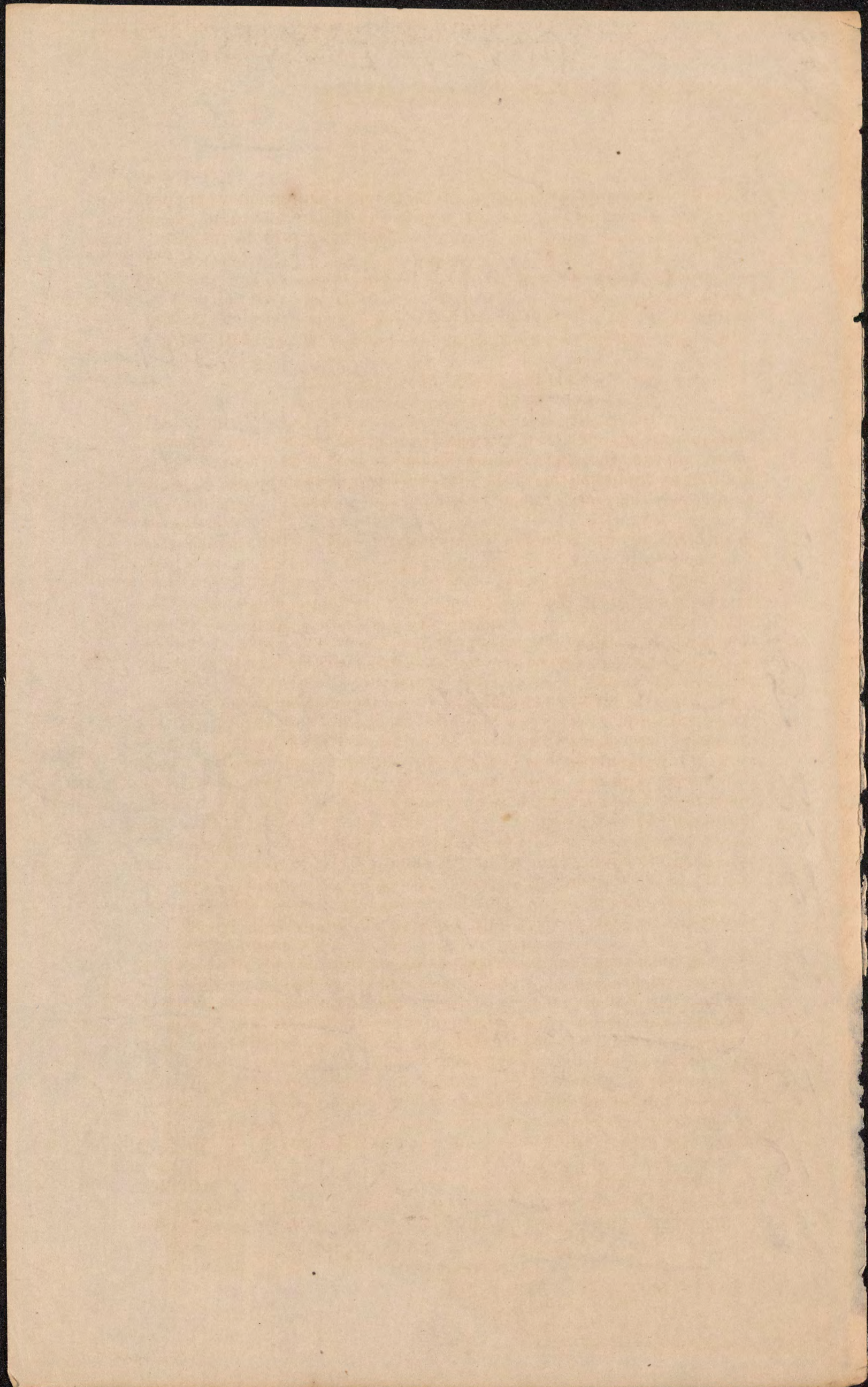
13. Carbolic Acid - pure offensive crude -
Chloralum & Carbolate of lime.

14. Salicylic Acid -
15. Ozone

16. Cold -

17. Heat.

N. M. Brown & Anst
Carbolium + Sulph. zinc
Lime



UNDER ROYAL



CHLORAL

(The Saline Antiseptic; harmless)

A Safe, Odourless, Non-Poisonous

CHLORALUM prevents decomposition and arrests it the noxious gases resulting from putrefaction, and does not deteriorate and destroy alimentary and other substances.

FOR MEDICAL PURPOSES it is invaluable, as a styptic, without causticity or other hurtful property, and is particularly useful in the suppression of hemorrhage.

FOR SANITARY PURPOSES it is the best agent to use in closets, urinals, sinks, cesspools, and to water roads, alleys, &c.

IN THE SICK ROOM a harmless and powerful antiseptic to replace the highly poisonous chlorides in use.

CHLORALUM preserves provisions, and cleaned fish may be kept in solution for days, without losing any of its firmness and freshness.

IN THE PROCESS OF SALTING meat or fish, a small quantity of Chloralum to the brine affords a guarantee against taint.

FARMERS can rely on it in contagious diseases, foot and mouth, &c.

The LANCET (August 27th, 1870), says of this preparation:—"It is as Chloride of Zinc or Carbolic Acid, and is at the same time more pleasant than the unpleasant smell of every kind. These qualities will, no doubt, be appreciated, and at no distant date we may expect it to displace the present in vogue."

The BRITISH MEDICAL JOURNAL of Oct. 15th 1870, says:—"The designation of chloralum, a new antiseptic has been introduced to the public generally, which bids fair to take up an important place among the valuable substances, the antiseptics and disinfectants. The chemical action of Chloride of Aluminium depends, to some extent, upon there being a free muriatic acid. Ammonia—both the common ammonia, and even the most offensive organic ammonia (and it is substances of this class that give rise to the varieties of stink arising from garbage)—is instantly absorbed by the muriatic acid. Moreover, there is the high probability (of great certainty) that the chloride of aluminium forms double compounds with the various oxides thereby produced. Many bad smells which carbolic acid might destroy by the virtue of its own strong odour, but which it cannot destroy, are absorbed by the chloride of aluminium. In this respect, chloralum has some advantages over a permanganate solution, which, as we all know, destroys foetor by its oxidizing substance, but which is almost powerless against, or acts very slowly upon, the varieties of malodorous things that have the property of not being volatile. The smell arising from putrid fish affords a specially favourable case to test the powers of chloralum. Even chloride of lime is hardly so potent against foetor as is chloralum. The agent in general use to which chloralum may be compared is Chloride of Zinc, which, like it, is specially potent against organic ammonias. Suppose that Chloride of Zinc, instead of being poisonous, and that, instead of being corrosive, its strong solution were incapable of destroying fabrics; and suppose that its cost price were diminished to one-tenth, then it would be an adequate representative of the new antiseptic and disinfectant, chloralum. The MEDICAL TIMES AND GAZETTE of September 1st 1870, states:—"That certainly the new antiseptic Chloralum is a very new agent for the prevention of putrefaction."

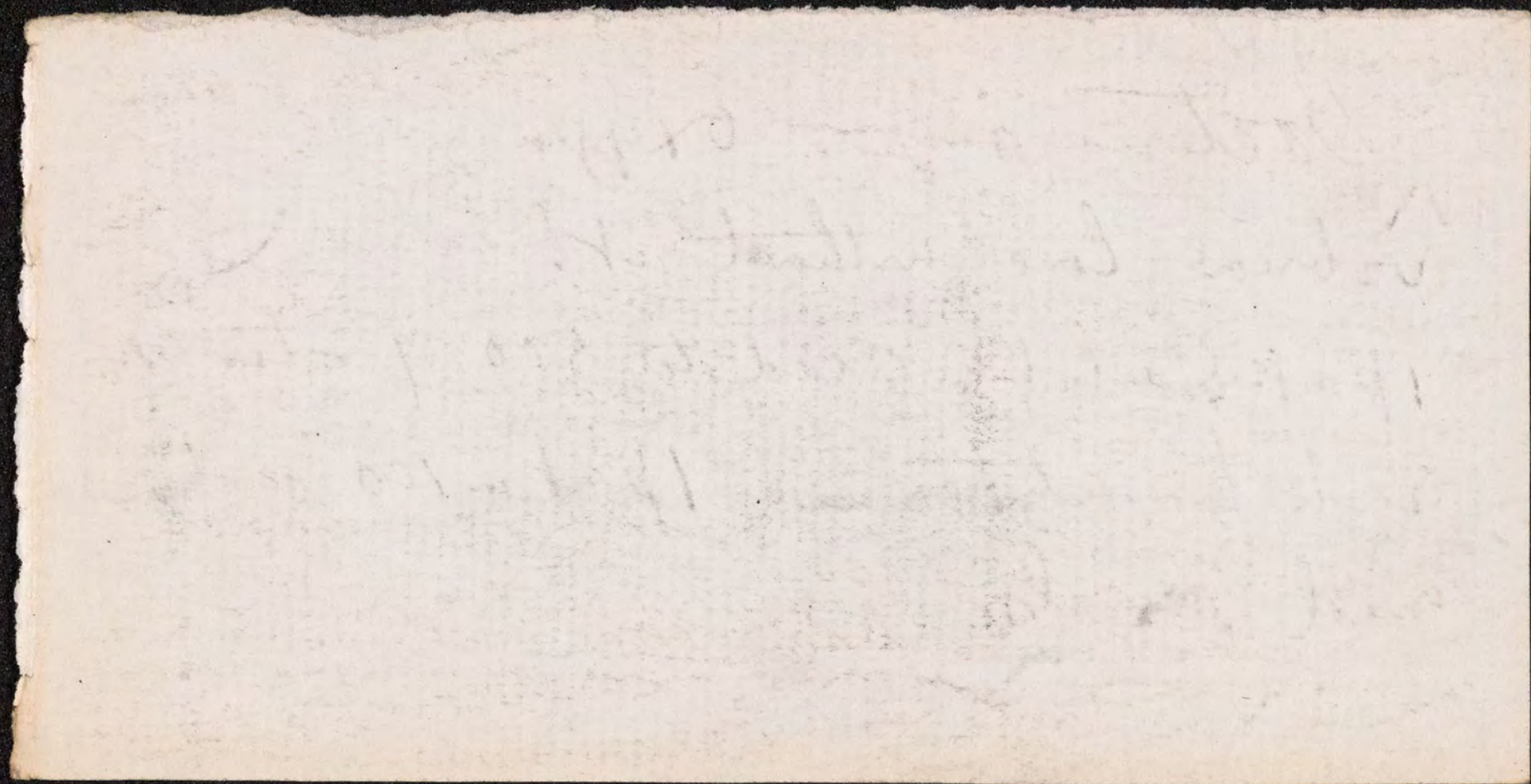
The CHEMICAL NEWS of Sept. 1st 1870, says:—"The properties it possesses are, that it is non-poisonous, and a powerful antiseptic."

~~Monads &~~

~~Bacteria require oxygen.~~

~~Vibrios live without it (unless got by decomposition of tissues?)~~

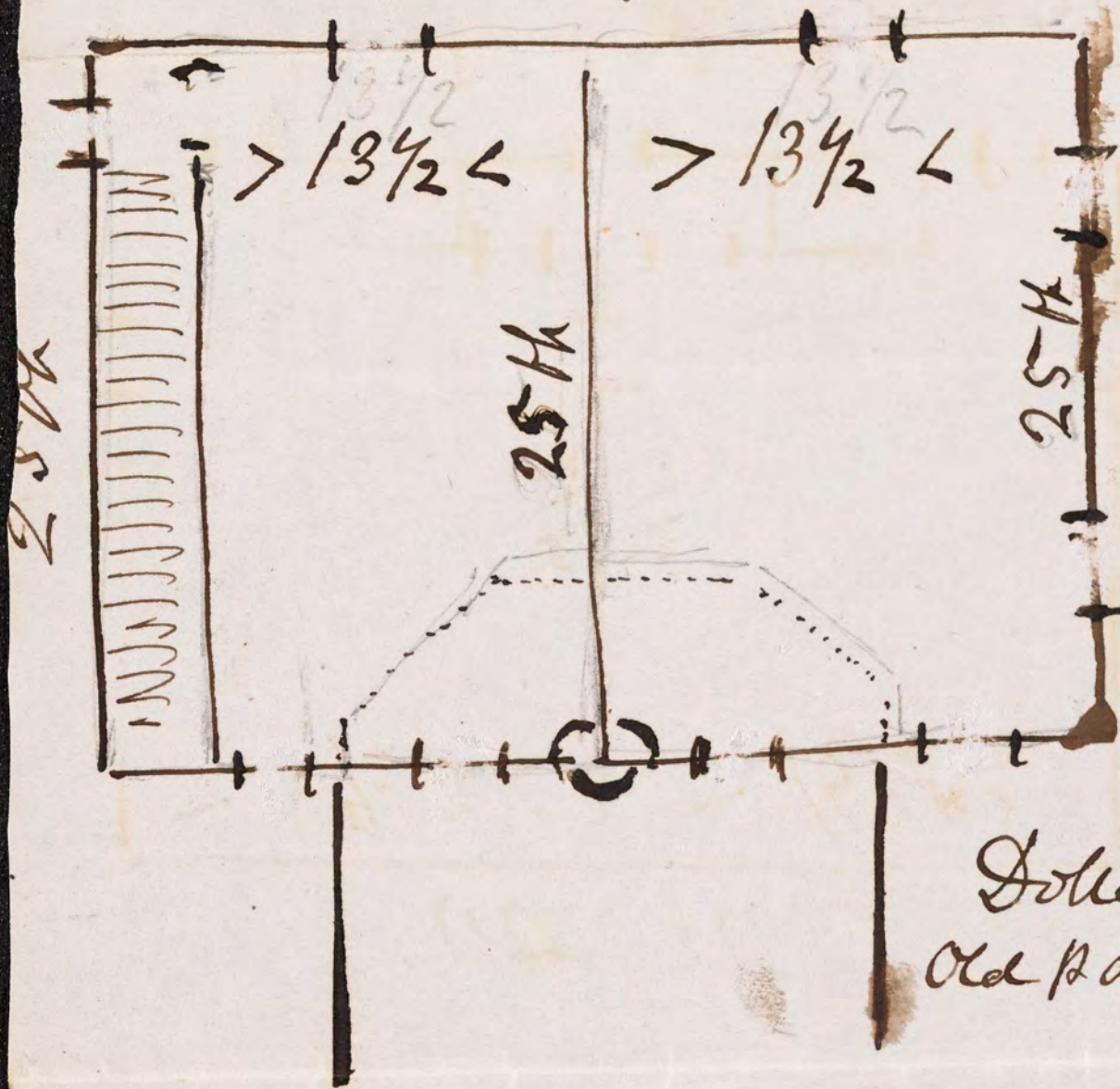
1 part Carbolic acid to 500 of water arrests fermentation - 1 part in 100 destroys small animals.



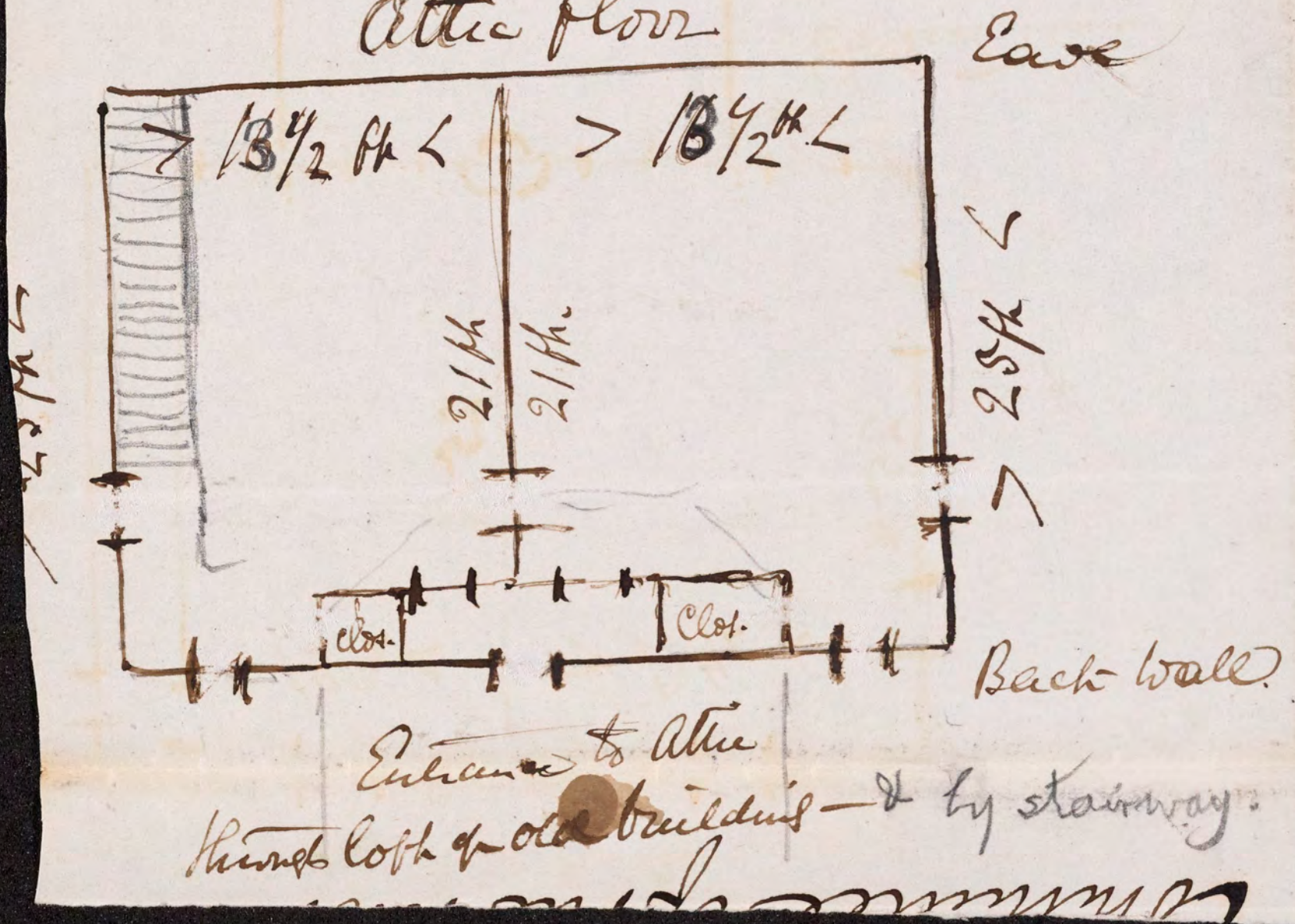
Plans for
addition to Edgecombe Cottage

[For floor over damp cellar:
2 parts tar, 1 part pitch,
& 3 handfuls quicklime to
each bucketful.]
Waring.

Second floor



Attic floor



~~Cold or Disinfection.~~
further

← I may mention, that

Ridgewood's Disinfectant contains
a little
Carbolic acid (from 5 to 8 per
ct.) lime (from magnesian lime
stone) 5 per ct. fuller's earth,
70 to 80 per ct. — with a little
sulphate of potash and sulphate
of soda —

McDougal's Disinfectant, — much
used in England & India, — contains
sulphates of magnesia & lime, — &
carbonate of lime.

Cornu & Demours' powder,
of 94 per ct. finely ground gypsum,
& 5 or 6 per ct. of coal tar or heavy oil of coal
tar.

(Cold In Disinfection.)

o Deodorization of breath.

^ P. Myrrh — ^{aromatic} pastilles —

charcoal —

pungy potass —

chlorate soda —

State of secretions —

esp. skin & bowels

— very important —

Digestion & condition of teeth

as much — the best most so of all

Bromochloralum also —

Demeaux also introduced
a neat preparation for
chamber vessel disinfection,
or water closets: —

Equal parts of coal tar,
alcohol (whiskey will do) &
hot soft soap. Soap is a
good deodorant
& partial disin-
fectant.

The Phenol Sodique
of Boheaux, which I showed
you at the last lecture, I
suppose to be ^{essentially} a carbolate of
Soda. 
Chloralum ~~is a~~
chloride of aluminium; it is new (1872) & not proved ~~Chloride of zinc~~
(Condy's liquid - Potassium of Potash)
Burnetts liquid.

07
Capt. Lierniss
Pneumatic ant-ticks
Pump cleaning method

See
Parker on
Phil. B.
of West
1876.

Copy to a system
see Atlantic month
April 176

Am. Pub. Health Association Committee
RULES AND METHODS OF DISINFECTION.

X *For Privies, Water-Closets, Drains and Sewers.*—8 or 10 lbs. of Sulphate of Iron (copperas) dissolved in 5 or 6 gallons of water, with half a pint of crude Carbolic Acid added to the solution and briskly stirred, makes the cheapest and best Disinfecting Fluid for common use. It can be procured in every town and by any family, and if the Carbolic Acid is not at hand, the solution of copperas may be used without it.

*To prevent privies and water-closets from becoming infected or offensive :—*pour a pint of this strong solution into every water-closet pan or privy-seat once or twice a day.

*To disinfect masses of filth, privy-vaults, sewers and drains :—*gradually pour in this solution until it reaches and disinfects all the foul material.

For the chamber-vessels used by the sick, and for the disinfection of ground upon which any excremental matter has been cast away, use the solution of Copperas and Carbolic Acid ; and, for disinfecting extensive masses or surfaces of putrescent materials, and for drains, sewers and ditches, this Disin-

SANITARY CLEANSING.

The *local conditions* that chiefly promote the outbreaks and propagation of Cholera are—

- (1.) Neglected Privies;
- (2.) Filth-sodden Grounds;
- (3.) Foul Cellars, and filthy or badly-drained surroundings of Dwellings;
- (4.) Foul and obstructed House drains;
- (5.) Decaying and Putrescent Materials, whether Animal or Vegetable;
- (6.) Unventilated, damp, and uncleansed Dwellings and Apartments.

These localizing causes of Cholera should be promptly and very thoroughly removed before a case of the disease appears in the town or district; and if any sources of putrescence, or of excessive moisture remain, these should be controlled by the proper cleansing, drying, and disinfection.

[Don't copy]

1874

TRY.

Berlin Press 63

dent of Police, after consultation with the Association of Berlin Pharmaceutists, has recommended a substance known as "Composition." It consists of chloride of magnesium, iron, oxide of manganese, and carbolic acid. This has been found by various experiments to be the most effectual disinfectant. The first substance absorbs the ammonia, and the last arrests and prevents fermentation and decay.

2

Practical Chemistry and the Arts.

THE BRIGHTON ABATTOIR.

BY S. P. SHARPLES, STATE ASSAYER.

THE town of Brighton is situated on the Charles River, just west of Boston, to which city it has recently been annexed. The town has

fecting Fluid may be used, or the "dead oil" ("heavy oil") of coal-tar, or coal-tar itself: coal-tar may be used as a paint upon the walls of cellars, stables, and open drains.

Other Disinfectants,—such as the solutions of Sesquichloride of Iron, or of Chloride of Zinc, are effectual in Privies and Drains, and upon foul surfaces and offensive materials. These metallic chlorides, combined with a twentieth part of carbolic acid, make one of the most valuable disinfectants.

Quick-lime is useful as an absorbent and dryer upon foul walls and in damp places: and *whitewashing* with it should be practised in common tenements, factories, basements, closets, and garrets.

To disinfect the clothing or bedding defiled in any manner by excremental matters from the sick, throw them into a solution made as follows: 1 lb. of Sulphate of Zinc to 6 or 8 gallons of water, to which add 2 or 3 ounces of *pure* and strong Carbolic Acid—such articles to remain therein at least half an hour; then immediately place them in boiling water, and continue boiling. If the Acid is not at hand, then use the solution of Zinc in water. The same Disinfecting solution is excellent for bed-pans and chamber-vessels, and for soiled floors or defiled surfaces.

Apartments, bedding and upholstery that have been used by the sick with Cholera or Diarrhœa, should be thoroughly cleansed and disinfected.

circumstances of filth or foul air and high temperature. In view of such facts, the Committee would most respectfully recommend and urge that the greatest care be taken to disinfect and remove all deposits of human excrement in privy vaults, and to keep all such places, all filthy grounds, ditches, drains, house-sewers and water-closets, thoroughly disinfected: And in all cases of cholera, or of choleraic diarrhoea, it is earnestly recommended that the discharges from the stomach and bowels shall be carefully disinfected with the carbolic acid and iron disinfectants before being cast away.

4. Cleansing and purity, skilful disinfection, temperate habits, and wholesome diet with pure water and fresh air, are the trusted and sure means of health and security in all places and for all classes of people when exposed to the causes of Cholera. The watchword against this destructive enemy should be,—Cleanse, *Cleanse*, CLEANSE!—Remove the local causes that favor the propagation of Cholera, and wherever it appears, let its germs be quickly stamped out by powerful disinfectants, and special cleansing.

From being the most feared and destructive pestilence, Cholera has become entirely submissive to *sanitary measures of prevention*, and can now be controlled with such certainty and completeness as to prevent its ravages as an epidemic. Believing, therefore, that the people of the United States will wisely apply the *principles* which are given in this memorandum, the

